Dupont 100" Telescope

Newtonian Folding Flat

Final Polishing Results

S/N 3
Dupont

January 27, 2000

DATA SUMMARY SHEET FOR CARNEGIE DUPONT OPTIC

Surface Quality (Shear Data)

Shear (cm)	RMS(λ) for X Shear	RMS(λ) for Y Shear	Specification (λ rms)
2	0.007886	0.007280	0.0237
5	0.01436	0.01391	0.0427
10	0.02219	0.02152	0.0648
20	0.03636	0.03155	0.0901
50	0.05043	0.05066	0.0901

Surface Roughness

Surface Roughness (A rms) Data	Avg. Surface Roughness(A rms)	Specification
3.7, 3.5, 4.0, 4.1, 3.8, 3.0, 3.5, 3.8	3.7	20 A

Scratch / Dig

Scratch / Dig Data	Specification
No scratches or digs outside of specification detected	60/40
Open bubble 0.023 dia. 3 3/8" from OD	Noted
Metallic contaminant 0.015" x 0.010" approx 1.5" from OD	Noted

The disc contains Array 1003 P24.oas and 1003P24.xls. These are ASCII and Excel arrays of the surface clear aperture of plano S/N 3 (Dupont) using data from the full four orientation test.

The array is 79 by 111 with increments of .3937 inches (1 cm) and starting points (in the lower left corner) of x start= -15.3543 and y start = -21.6535.

The header gives a title and the number of data values in the array. The first 8 data values give array parameters as follows: type (1), x size; y size, X increment. Y increment, X start, Y start, obstructed aperture (invalid data) value (10000.000000). The surface array data reads out in x; and increments up in y.

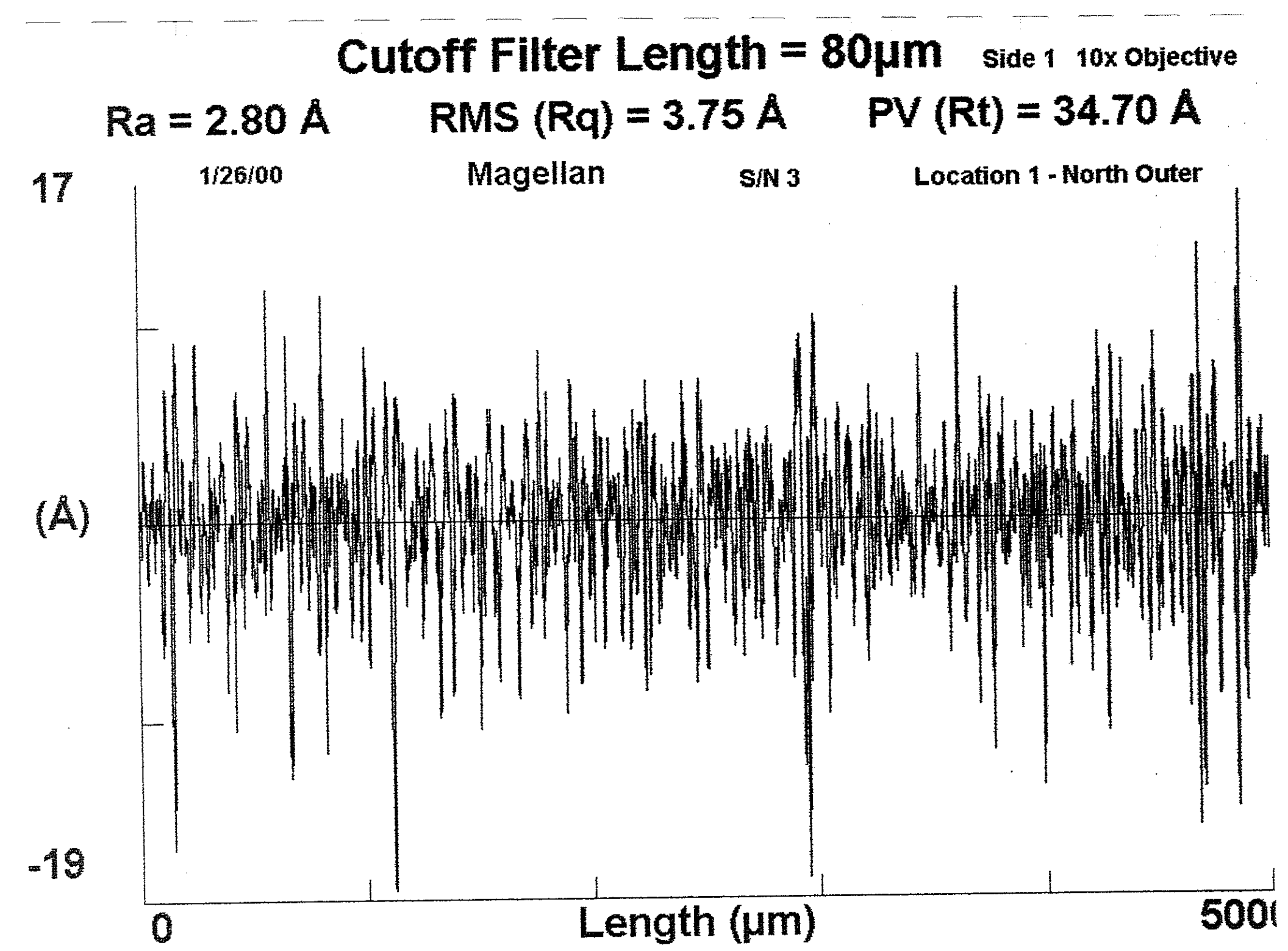
MAGELLAN
SERIAL NUMBER 3
CHAPMAN 2000

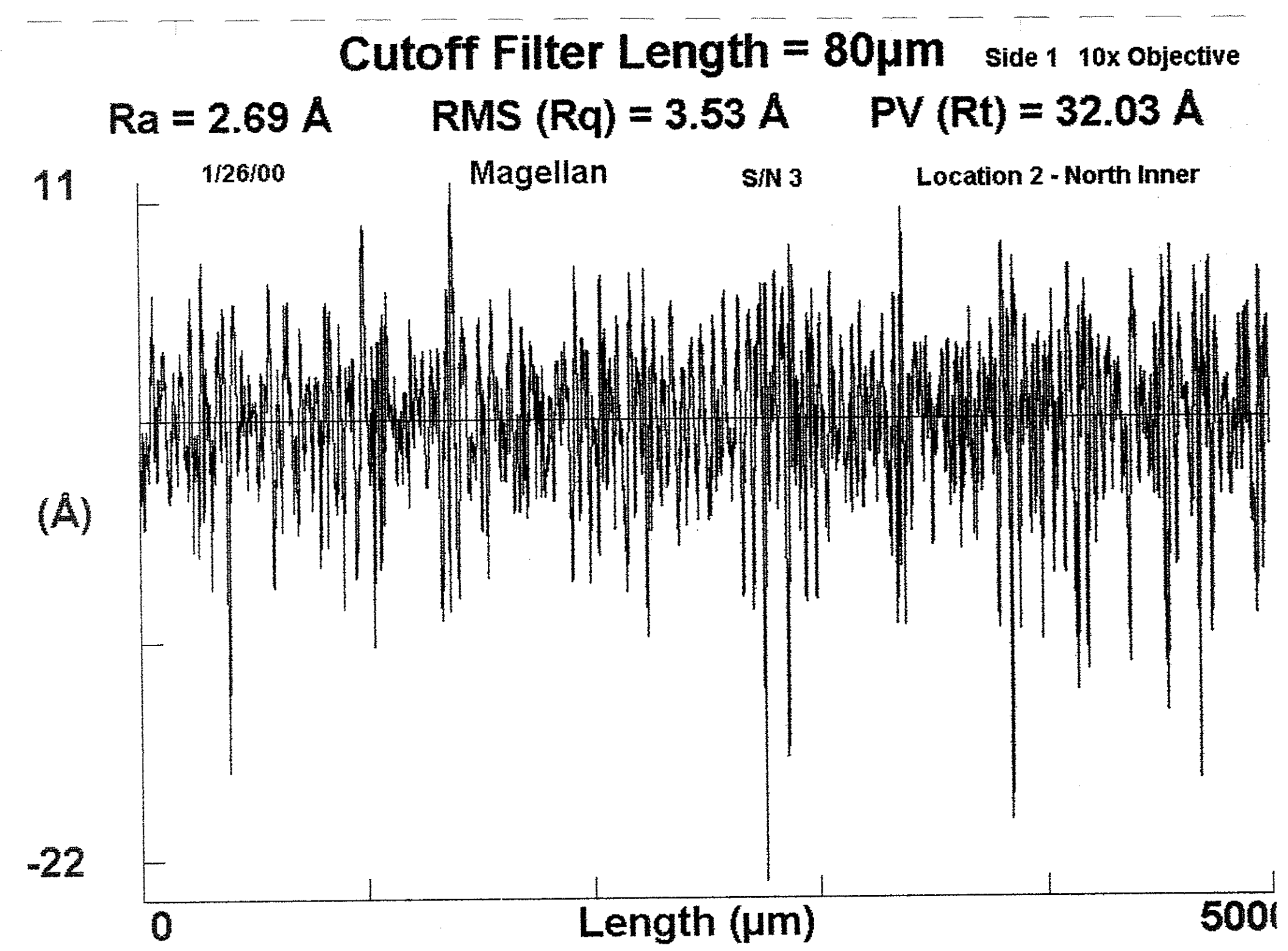
Location 1 North Outer		Location 2 North Inner		Location 3 South Outer		Location 4 South Inner	
RMS (A)	P-V (A)	RMS (A)	P-V (A)	RMS (A)	P-V (A)	RMS (A)	P-V (A)
3.76	35.96	3.43	34.78	3.98	35.75	4.25	45.98
3.75	34.70	3.58	31.68	3.97	34.39	3.95	39.73
3.74	34.59	3.53	32.03	3.95	37.47	3.98	43.50
3.58	33.57	3.47	32.92	3.95	36.80	4.03	45.55
3.54	40.31	3.51	34.00	3.96	36.51	4.15	47.31
AVRG 3.67		AVRG 3.50		AVRG 3.96		AVRG 4.07	

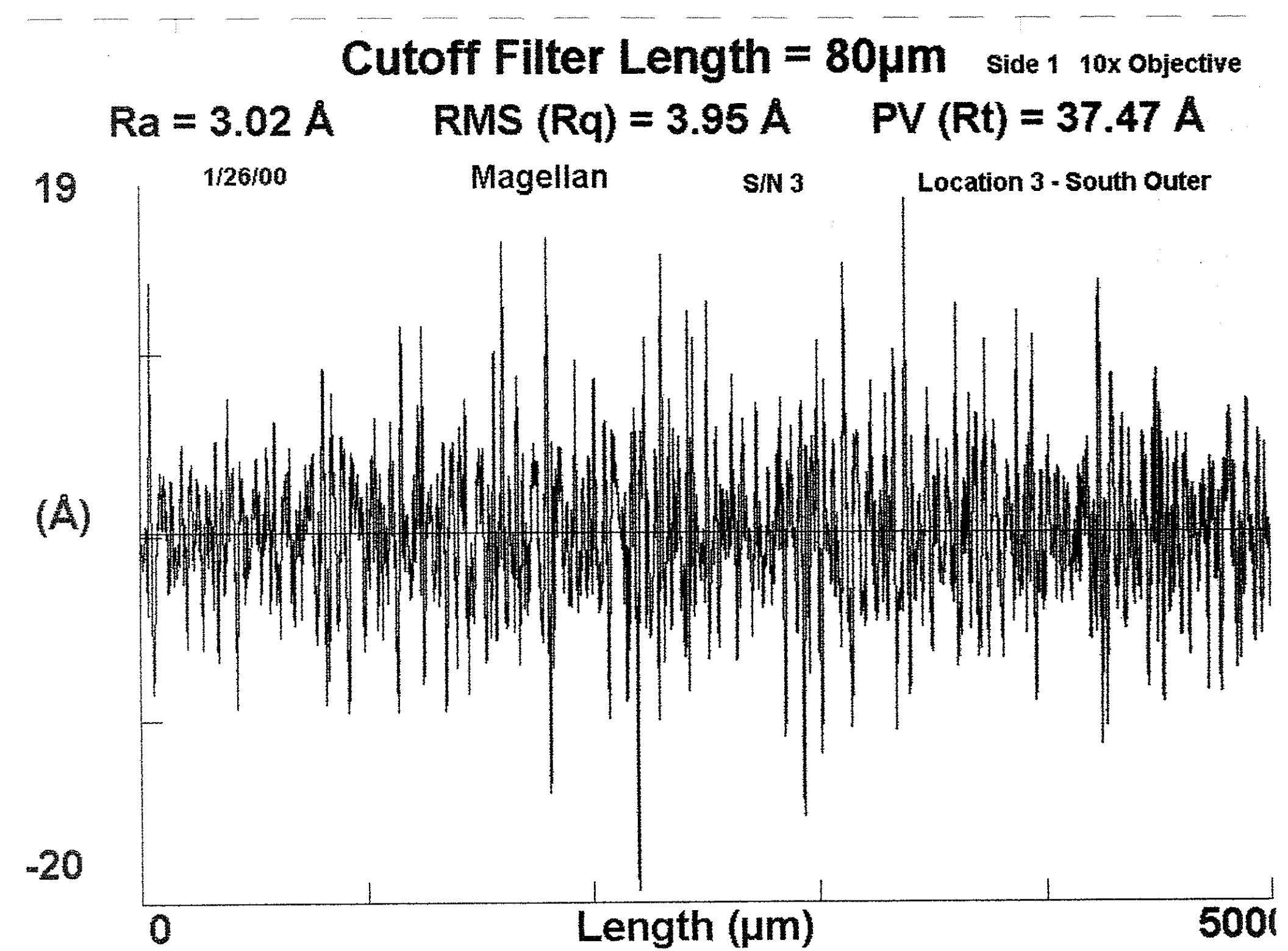
Location 5 West Outer		Location 6 West Inner		Location 7 East Outer		Location 8 East Inner	
RMS (A)	P-V (A)	RMS (A)	P-V (A)	RMS (A)	P-V (A)	RMS (A)	P-V (A)
3.80	59.38	3.09	28.76	3.45	39.64	3.90	32.86
3.80	55.13	2.95	26.84	3.47	33.86	3.63	31.97
3.84	53.80	2.97	27.35	3.43	35.00	3.72	35.23
3.84	64.25	2.97	28.33	3.46	41.75	3.82	35.17
3.85	62.90	2.90	27.20	3.48	39.28	3.82	31.85
AVRG 3.83		AVRG 2.98		AVRG 3.46		AVRG 3.78	

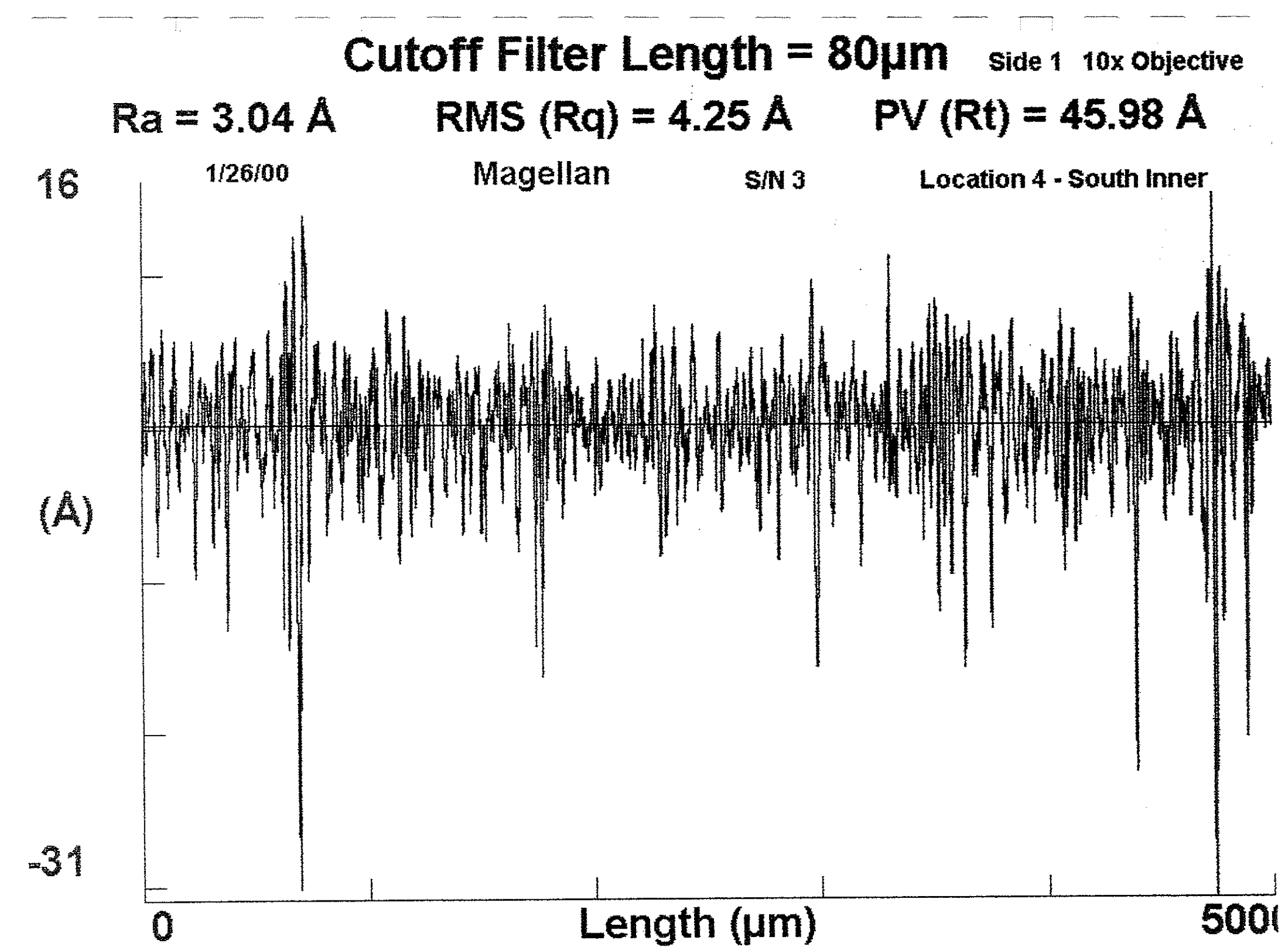
FILTER CUT OFF .08MM
SCAN LENGTH 5.0MM

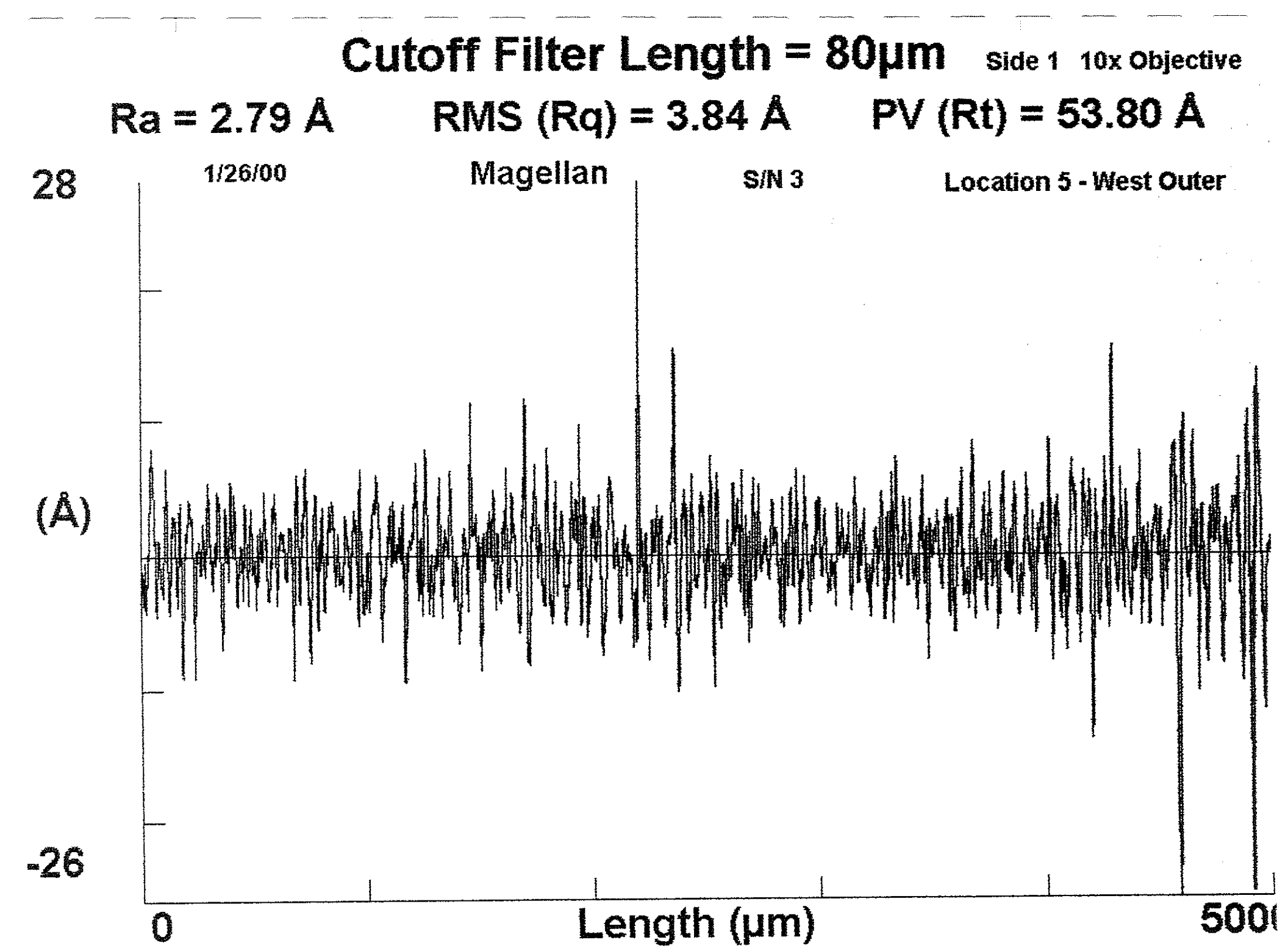
CATHY SILVIO
1/26/00

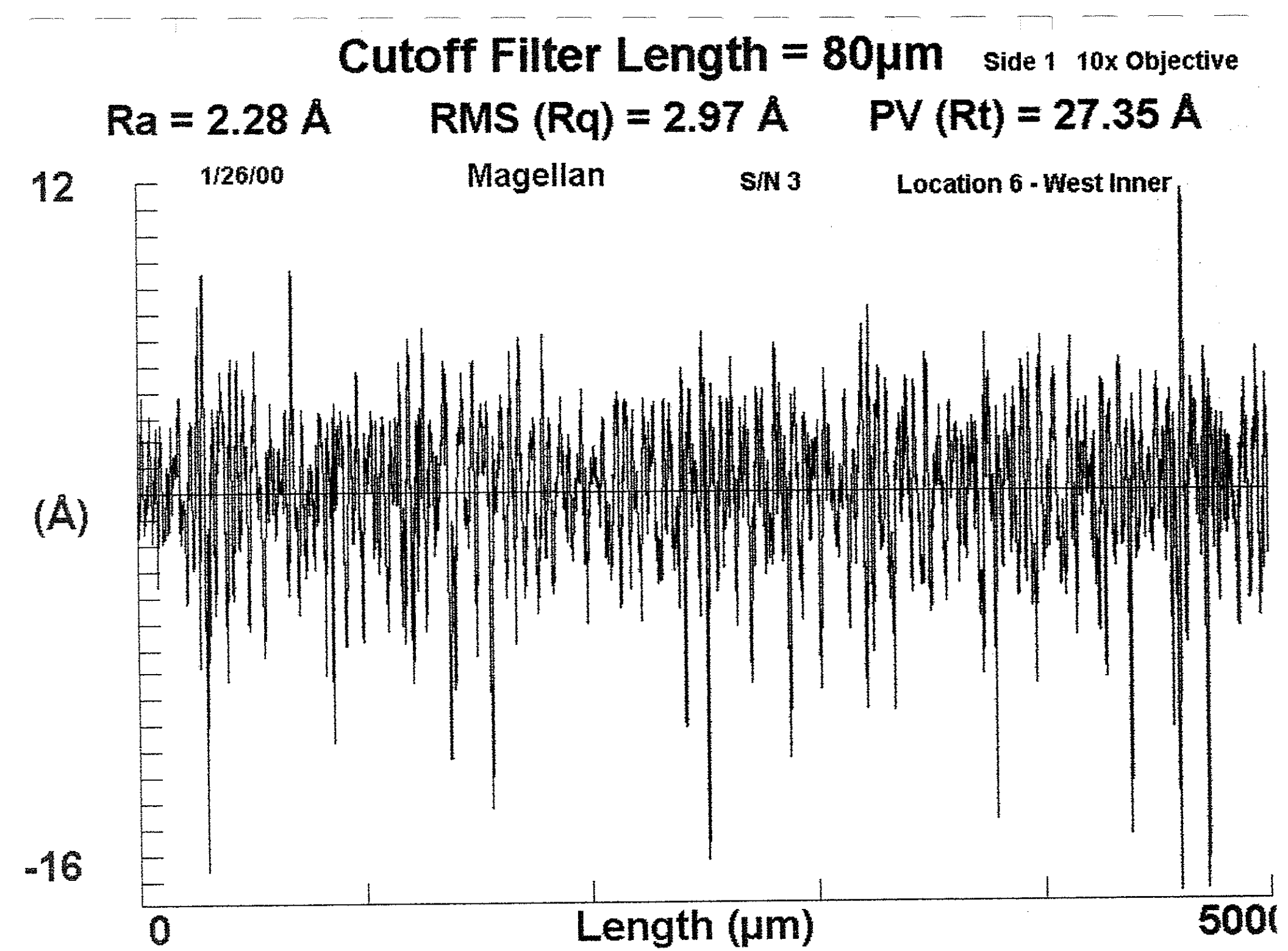

Cutoff Filter Length = 80µm
Side 1 10x Objective
Ra = 2.80 Å
RMS (Rq) = 3.75 Å
PV (Rt) = 34.70 Å
17
1/26/00
Magellan
S/N 3
Location 1 - North Outer
(Å)
-19
0
Length (µm)
500

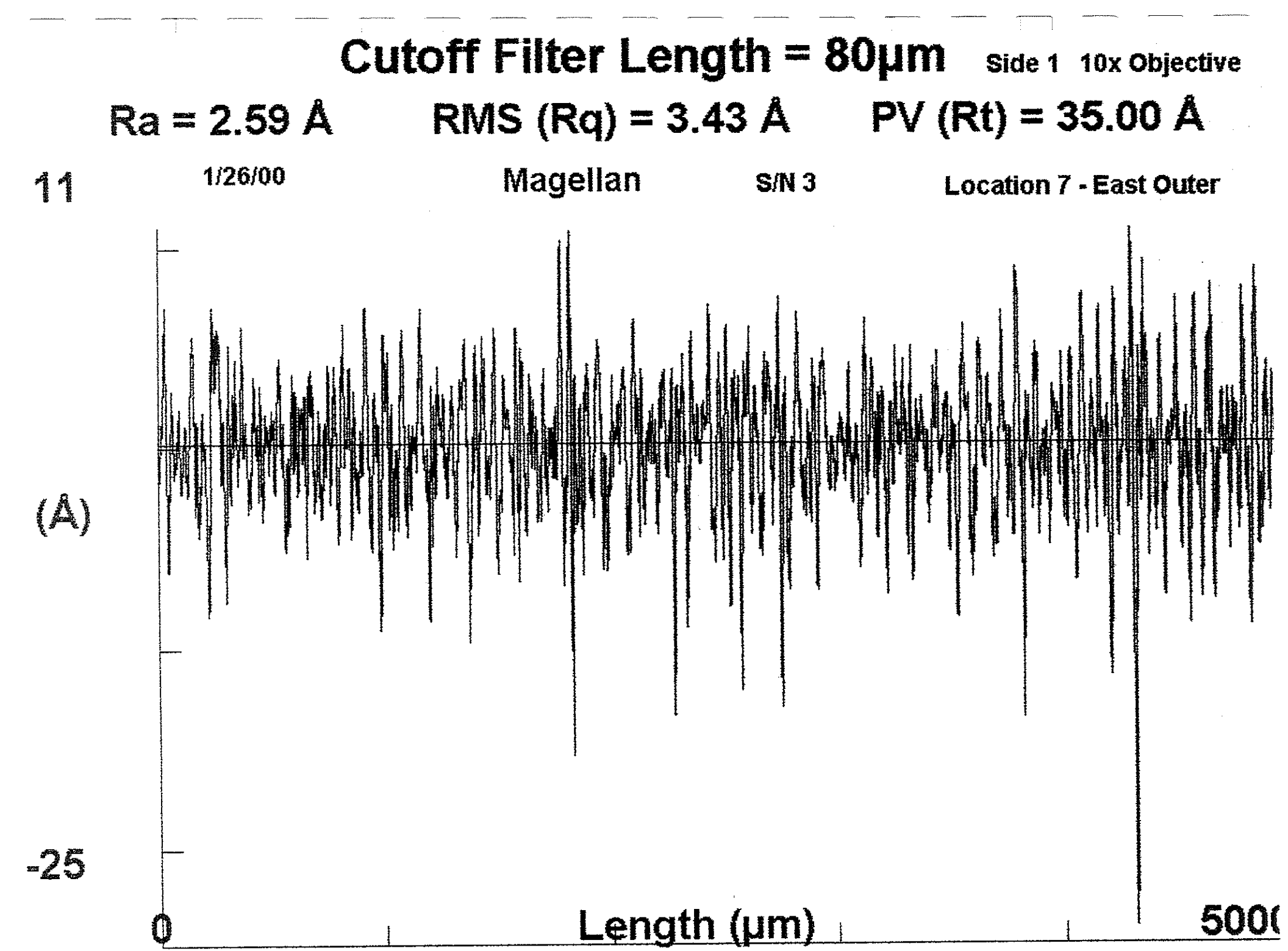

Cutoff Filter Length = 80µm
Side 1 10x Objective
Ra = 2.69 Å
RMS (Rq) = 3.53 Å
PV (Rt) = 32.03 Å
11
1/26/00
Magellan
S/N 3
Location 2 - North Inner
(Å)
-22
0
Length (µm)
500

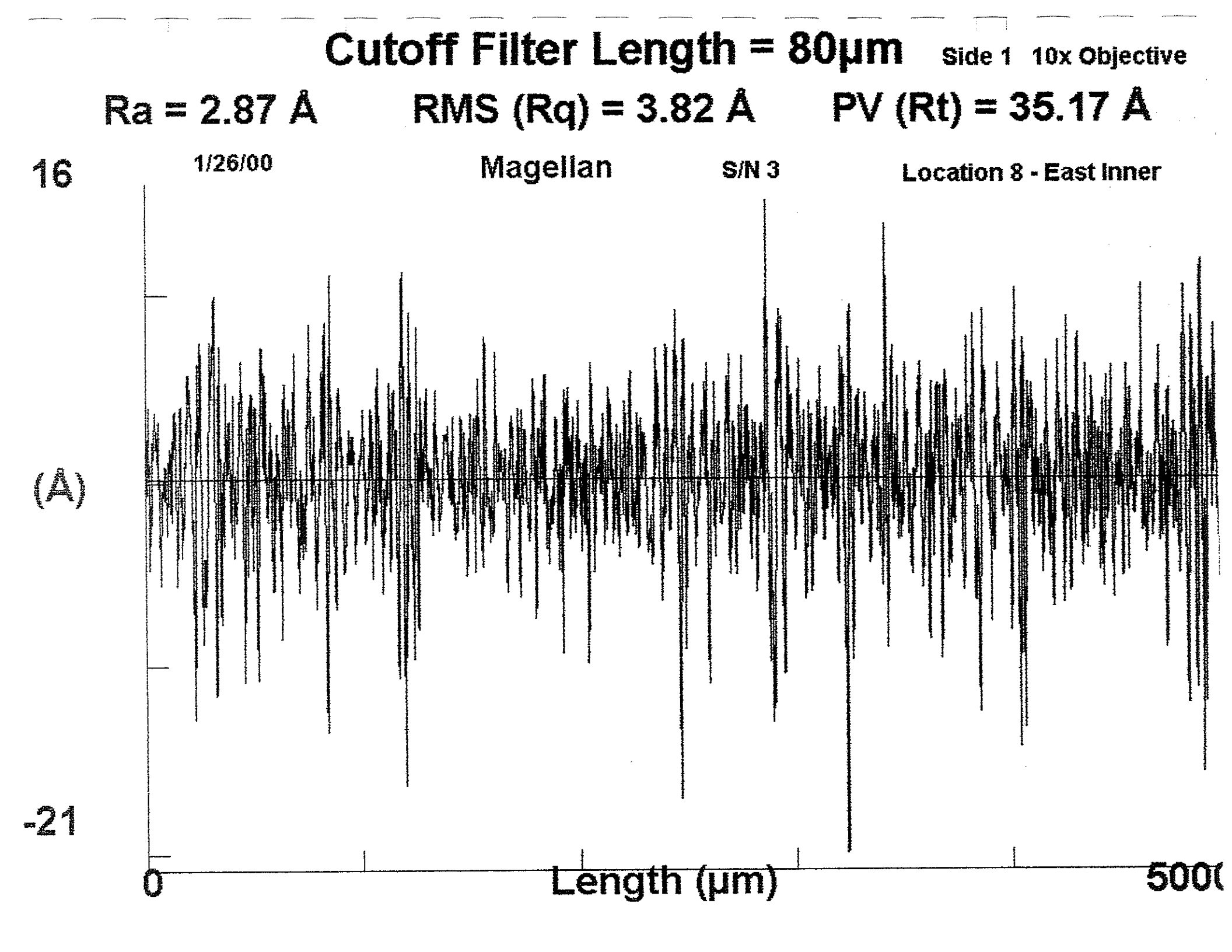

Cutoff Filter Length = 80µm
Side 1 10x Objective
Ra = 3.02 Å
RMS (Rq) = 3.95 Å
PV (Rt) = 37.47 Å
19
1/26/00
Magellan
S/N 3
Location 3 - South Outer
(Å)
-20
0
Length (µm)
500


Cutoff Filter Length = 80µm
Side 1 10x Objective
Ra = 3.04 Å
RMS (Rq) = 4.25 Å
PV (Rt) = 45.98 Å
16
1/26/00
Magellan
S/N 3
Location 4 - South Inner
(Å)
-31
0
Length (µm)
500


Cutoff Filter Length = 80µm
Side 1 10x Objective
Ra = 2.79 Å
RMS (Rq) = 3.84 Å
PV (Rt) = 53.80 Å
28
1/26/00
Magellan
S/N 3
Location 5 - West Outer
(Å)
-26
0
Length (µm)
500


Cutoff Filter Length = 80µm
Side 1 10x Objective
Ra = 2.28 Å
RMS (Rq) = 2.97 Å
PV (Rt) = 27.35 Å
12
1/26/00
Magellan
S/N 3
Location 6 - West Inner
(Å)
-16
0
Length (µm)
500


Cutoff Filter Length = 80µm
Side 1 10x Objective
Ra = 2.59 Å
RMS (Rq) = 3.43 Å
PV (Rt) = 35.00 Å
11
1/26/00
Magellan
S/N 3
Location 7 - East Outer
(Å)
-25
0
Length (µm)
500


Cutoff Filter Length = 80µm
Side 1 10x Objective
Ra = 2.87 Å
RMS (Rq) = 3.82 Å
PV (Rt) = 35.17 Å
16
1/26/00
Magellan
S/N 3
Location 8 - East Inner
(Å)
-21
0
Length (µm)
500(

INSPECTION REPORT

PART NO. & REV.	QA JOB NO.		DATE REC'D	QUAN. REC'D
Rev. E 95TE0501	187491		1/28/2000	1
	P. O. NO.	Q. C. LOT NO.	DATE INSP'D.	QUAN. INSP'D
		C23424	1/28/2000	1
PART NAME	P. O. LINE ITEM	INSP. PROC. NO.	INSP DEPT.	QUAN. OK
Tertiary Mirror		Z-4856	331	1
PART SERIAL NO.'S	NMDR			QUAN. VARYING
003				0
VENDOR/MFG. DEPT.	CERTIFICATION			WO NO.
PUR. FAB. ☐ ☒	REQ'D YES ☐ NO ☐	REC'D YES ☐ NO ☐	INSP. TIME	WO SEQ. NO.

NMDR SUMMARY		
NMDR SERIAL NO.		
DISPOSITION	QTY.	SERIAL NO.'S
ACCEPT		
SCRAP		
REWORK IN HOUSE		
REPAIR		
RETURN TO VENDOR		
SHIPPING ORDER NO.		

☐ ADDED OPERATIONS
☐ JOB COMPLETE

CHARACTERISTIC CHECKED	DIMENSION OR SPECIFICATION	TOL	ACTUAL MEASUREMENT S/N	S/N	S/N	S/N	S/N	S/N	REMARKS
Post Ion / Wavefront / MicroRoughness testing									
Carnegie Institute of Washington									
ULE Fritted lightweight, AWJ core									
Work Order # 99001-TW-S1-R0-003									
Structural inspection :						OK			OK
Cosmetic inspection : One site of metallic contaminate 0.015" x 0.010" in size,									
No detectable elevation difference from the polished surface.									
Located 1.5" from the OD								Reference	
only									
No out of spec. scratch - dig defects									OK
All fritted surfaces appear well wetted, frit fillets demonstrate adequate size and shape for good bond.									
MATERIAL									*N-NUMBER
VISUAL AND APPEARANCE									

SIGNATURE	DATE	INSP STAMP	PAGE OF	
W. O'Brien	1/28/2000	QA 164	1 / 2	C23424

KA 996 (REV. 2-96)

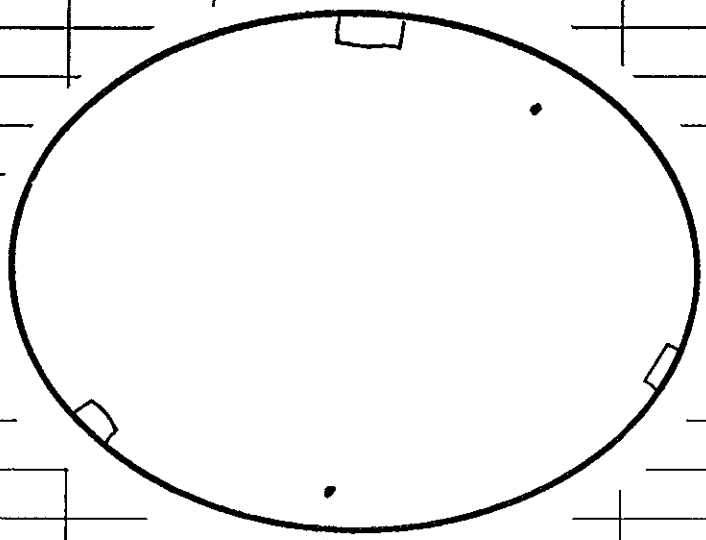
INSPECTION REPORT

PART NO. & REV.	QA JOB NO.		DATE REC'D	QUAN. REC'D
	P. O. NO.	Q. C. LOT NO.	DATE INSP'D.	QUAN. INSP'D
ART NAME	P. O. LINE ITEM	INSP. PROC. NO.	INSP DEPT.	QUAN. OK
PART SERIAL NO.'S	NMDR			QUAN. VARYING
ENDOR/MFG. DEPT.	CERTIFICATION			WO NO.
PUR. FAB. ☐ ☐	REC'D YES ☐ NO ☐	REC'D YES ☐ NO ☐	INSP. TIME	WO SEQ. NO.

NMDR SUMMARY		
NMDR SERIAL NO.		
DISPOSITION	QTY.	SERIAL NO.'S
ACCEPT		
SCRAP		
REWORK IN HOUSE		
REPAIR		
RETURN TO VENDOR		
SHIPPING ORDER NO.		

☐ ADDED OPERATIONS
☐ JOB COMPLETE

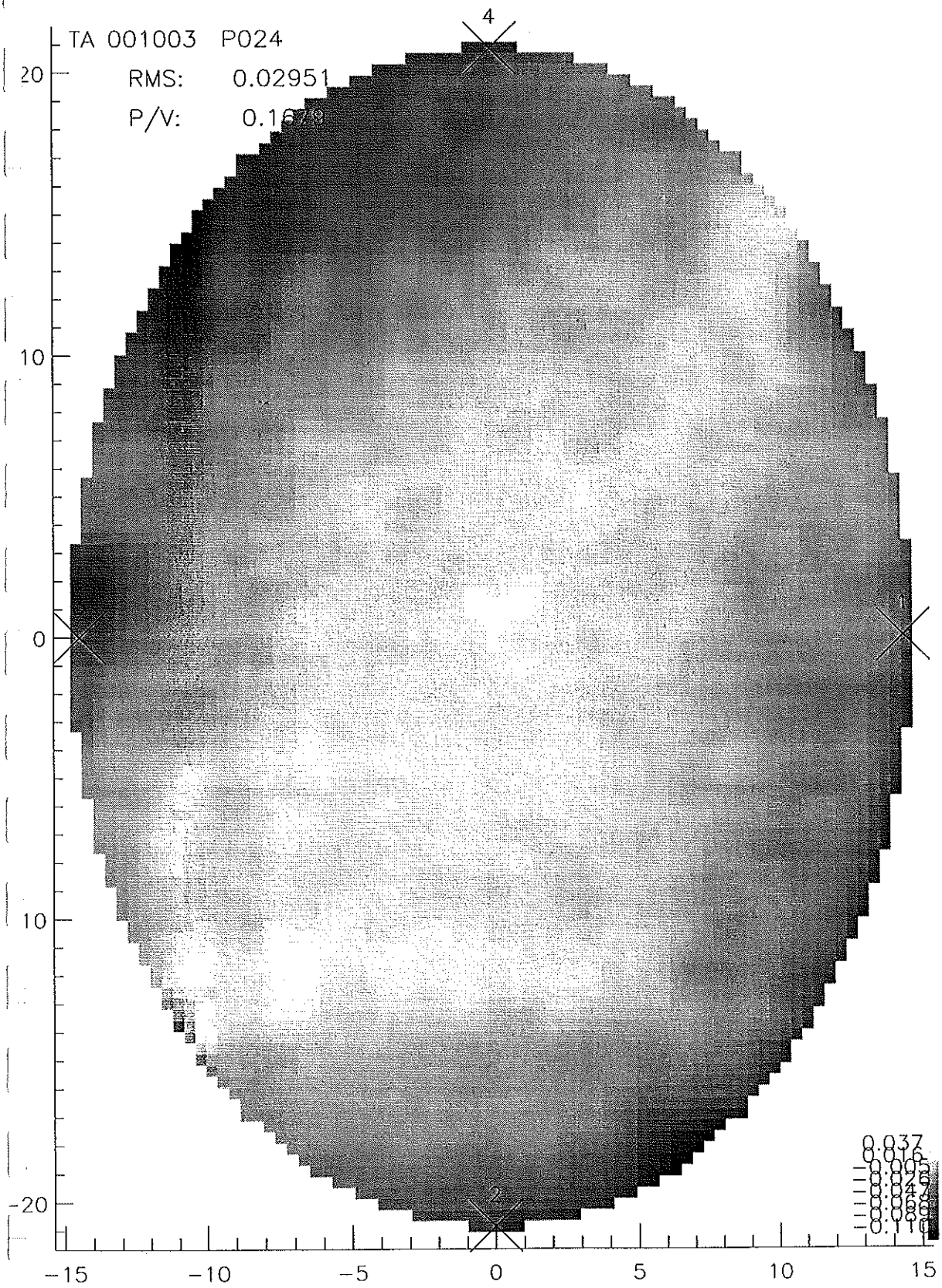
CHARACTERISTIC CHECKED	DIMENSION OR SPECIFICATION	TOL	ACTUAL MEASUREMENT S/N	S/N	S/N	S/N	S/N	S/N	REMARKS
					3				
					Fan Support				Open Bubble .023" dia. 3 3/8" from OD
	2								4
	Fan Support								Fan Support
TERIAL			Metallic Contaminate						*N-NUMBER
/ISUAL AND APPEARANCE			0.015" x 0.010" 1.5" from OD		1				



SIGNATURE	DATE	INSP STAMP	PAGE OF	
W. O'Brien	1-28-00	QA 164	2/2	C-23424

QA 996 (REV. 2-96)

CA Avg.


TA 001003 P024
RMS: 0.02951
P/V: 0.1679
4
1
2
20
10
0
10
-20
-15
-10
-5
0
5
10
15
0.037
0.016
-0.005
-0.026
-0.047
-0.068
-0.089
-0.110

********** WAVEFRONT COMBINATION PROCESS started at 0001240850 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: average area: common aggregate focus: wedge

TA	Pic	Flip	Rot	Mult	Focus
001003	023	--	--	1.0000	none

OPD SUMMARY **********

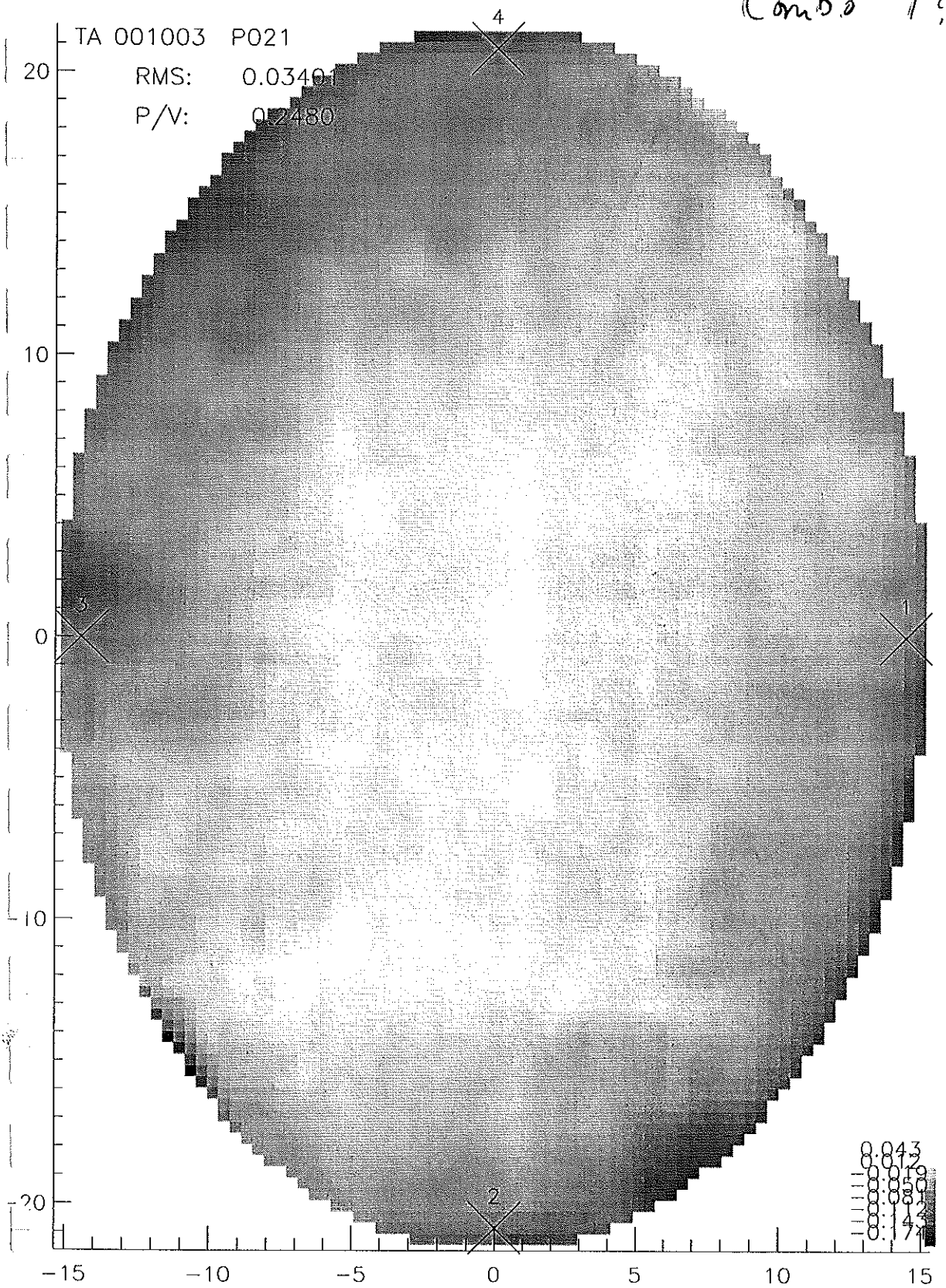
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003023	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.051	-0.183	0.034
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2 1S 2S 3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003023	0.001	1.011	32 70 94 98	0.026	0.014	0.013	0.012	0.012	0.011
999999999			30 67 95 99	0.023	0.011	0.011	0.010	0.010	0.009

TA/PIC	Power	Astig		Coma		Spher	Trefoil		Tetra	
	mag	mag	ang	mag	ang	mag	mag	ang	mag	ang
001003023	-0.151	0.150	67.5	0.027	96.9	-0.020	0.024	47.8	0.018	41.2
999999999	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1

Full Ap. ✗

Combo 1 & 2



Starting Combine orientations task combine_orientations
  result ta, picture: 999999 999
  orientation #1 ta, picture: 1003 1
  orientation #2 ta, picture: 1003 2
  test setup #1 ta, picture: 991106 100
  test setup #2 ta, picture: 991106 200

  surface ta, picture: 991106 100

SURFACE INFORMATION TA001003 P001 24-Jan-2000 08:48:54
TITLE: Magellan Tertiary Mirror S/N 2 - Full Optical Aperture

Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	14.4375	0.0000	03	-14.4375	0.0000
02	0.0000	-20.8375	04	0.0000	20.8375

Reference wavelength: 6328

Grid points: X: 79 Y: 111 Grid increments: X: 0.393700 Y: 0.393700
Grid start: X:-15.354300 Y:-21.653500

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	0.000	0.000	30.497	43.289	0.000

Obstructions (0) ----------

SURFACE INFORMATION TA001003 P002 24-Jan-2000 08:48:54
TITLE: Magellan Tertiary Mirror S/N 2 - Full Optical Aperture

Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	14.4375	0.0000	03	-14.4375	0.0000
02	0.0000	-20.8375	04	0.0000	20.8375

Reference wavelength: 6328

Grid points: X: 79 Y: 111 Grid increments: X: 0.393700 Y: 0.393700
Grid start: X:-15.354300 Y:-21.653500

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	0.000	0.000	30.497	43.289	0.000

Obstructions (0) ----------

TEST SETUP INFORMATION TA991106 P100 24-Jan-2000 08:48:54

Base length:		343.0640		
Central displacement	X:	0.0000	Y:	0.0000
Angle of incidence:		45.0000		
Surface rotation:		0.0000		

TEST SETUP INFORMATION TA991106 P200 24-Jan-2000 08:48:54

Base length:		343.0640		
Central displacement	X:	0.0000	Y:	0.0000
Angle of incidence:		45.0000		
Surface rotation:		-90.0000		

Difference array between input, unfocused arrays ----------

peak:	0.2000	valley:	-0.1252	rms:	0.0582

Special surface 1 coefficients:
0.052199, -0.000316, 0.000303, -0.002047
Special surface 2 coefficients:
-0.052143, -0.000178, -0.000459, -0.001670
(models: c1 + c2*x + c3*y + c4*(x^2+y^2)
[in the two pupil planes, aperture not normalized]

Difference array between refocused arrays ----------

peak:	0.0830	valley:	-0.0924	rms:	0.0158

Coefficients of final wedge model removed

*** Bias:	-0.08735		
*** Wedge:	0.00836	Angle:	33.45640

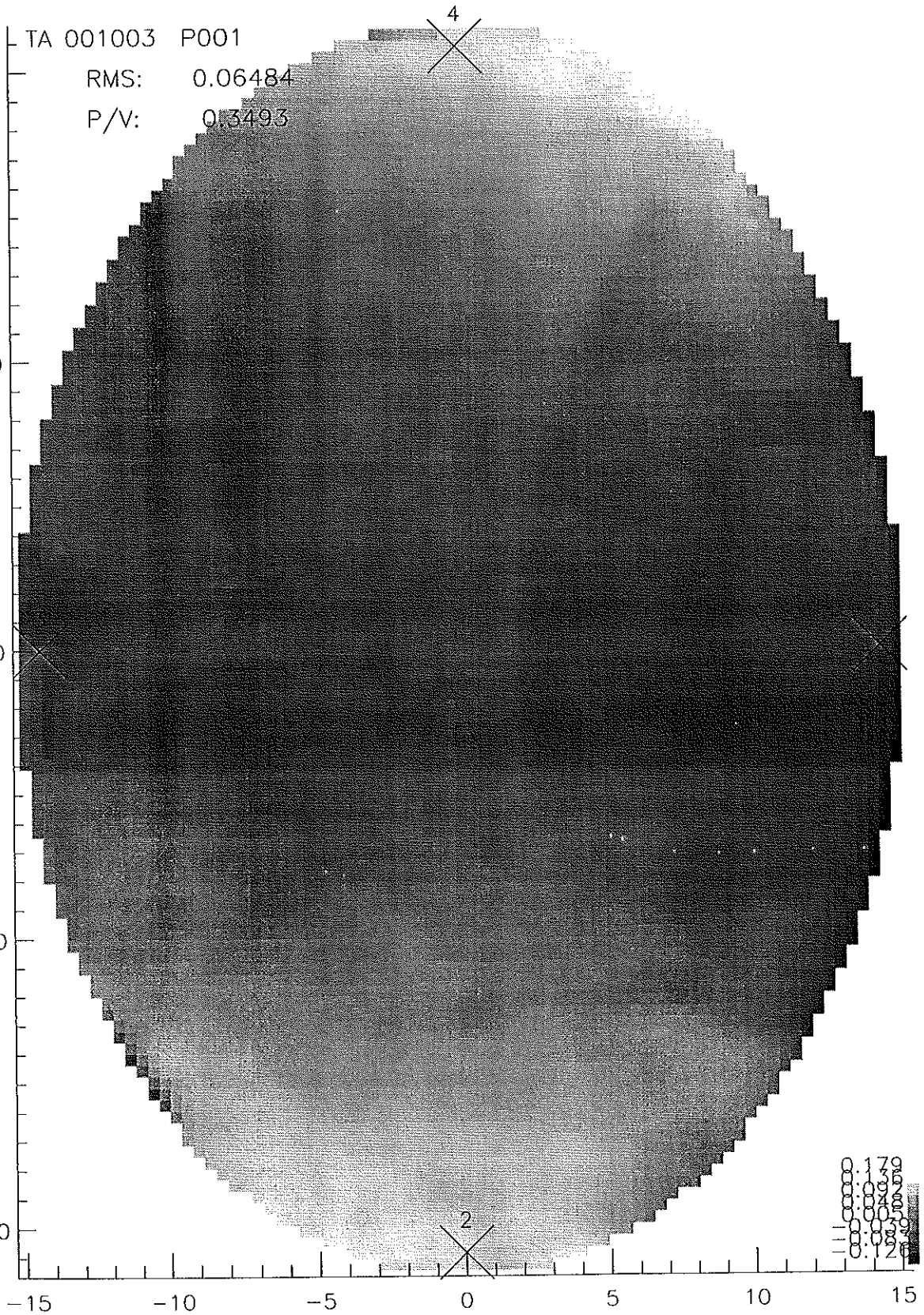
OPD SUMMARY **********

TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003001	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.201	-0.148	0.065
001003002	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.090	-0.136	0.024
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.058	-0.189	0.034

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003001			28	70	95	99	0.049	0.018	0.016	0.015	0.014	0.013
001003002			40	70	94	99	0.021	0.016	0.016	0.015	0.015	0.015
999999999			33	70	95	98	0.025	0.015	0.015	0.013	0.013	0.013

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003001	0.093	0.288	79.0	0.056	130.2	-0.021	0.049	42.5	0.017	-39.1
001003002	0.052	0.087	34.4	0.006	-30.2	-0.017	0.004	42.2	0.018	41.4
999999999	-0.149	0.140	68.7	0.026	119.3	-0.019	0.029	42.8	0.016	-43.9

0° ✓ 84


TA 001003 P001
RMS: 0.06484
P/V: 0.3493
4
2
20
10
0
10
-20
-15
-10
-5
0
5
10
15
0.179
0.135
0.091
0.047
0.003
-0.039
-0.083
-0.127

********** INTERFEROGRAM EVALUATION PROCESS started at 21-Jan-2000 19:09:03 **********

Result TA, Picture: 999999 999 Surface TA, Picture: 991106 100
Test setup TA, Picture: 991106 100 Backout TA, Picture: 991106 600
Transform TA, Picture: 001003 001

SURFACE INFORMATION TA991106 P100 21-Jan-2000 19:09:03
TITLE: Magellan Tertiary Mirror S/N 2 - Full Optical Aperture

Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	14.4375	0.0000	03	-14.4375	0.0000
02	0.0000	-20.8375	04	0.0000	20.8375

Reference wavelength: 6328

Grid points: X: 79 Y: 111 Grid increments: X: 0.393700 Y: 0.393700
Grid start: X:-15.354300 Y:-21.653500

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	0.000	0.000	30.497	43.289	0.000

Obstructions (0) ----------

TEST SETUP INFORMATION TA991106 P100 21-Jan-2000 19:09:03

Base length: 343.0640
Central displacement X: 0.0000 Y: 0.0000
Angle of incidence: 45.0000
Surface rotation: 0.0000

INTERFEROGRAM PROCESSING PARAMETERS
Wavefront passes: 4 Averaging type: unweighted Area: total
Design residual: 0 Mapping error: 0
Focus model: wedge

INTERFEROGRAM PROCESSED
TA 001003 Picture 001
TA 001003 Picture 002

TA 001003 Picture 003
TA 001003 Picture 004

INTERFEROGRAM INFORMATION TA991106 P600 21-Jan-2000 19:09:03
TITLE: 82" sphere robot middle fids (10.625"radius)

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	325.1415	474.8585	03	474.8585	325.1415
02	474.8585	474.8585	04	325.1415	325.1415

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 151 Wedge: Plus (+)

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	400.000	400.000	800.000	800.000	0.000

Obstructions (0) ----------

Transform coefficients (interferogram->pupil) for transform interferogram

-0.050368	0.0035881	36.978
-0.0032295	-0.049999	27.272

Transformation error: 0.0044857

Transform coefficients (pupil->interferogram) for backout interferogram

11.03	0.18699	402.43
-0.10929	11.132	397.64

Transformation error: 0.0024382

Transformed backout pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	324.789	474.776	03	474.504	325.058
02	475.210	474.941	04	325.497	325.225

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-0.00202		
*** Wedge:	0.02881	Angle:	18.61240
*** Power:	-0.17708		
*** Coma:	0.56574	Angle:	13.87937

Points interpolated 6681, extrapolated 0; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 5.26269.

INTERFEROGRAM INFORMATION TA001003 P001 21-Jan-2000 19:09:10
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	572.7812	504.8869	03	976.6950	478.9707
02	799.7867	913.9943	04	740.7090	84.4102

Reference Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	901.1769	350.0814	03	647.3394	632.7532
02	631.4916	364.5267	04	914.4582	617.8522

Test wavelength: 6328 Fringes: 17 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

-19.763	-1.4176	769.49
1.2782	-19.906	495.76

Transformation error: 0.0046916

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	573.564	508.432	03	977.432	482.311
02	799.028	910.552	04	739.950	80.968

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-8.65394		
*** Wedge:	34.29371	Angle:	-2.32776
*** Power:	0.36740		
*** Coma:	0.23383	Angle:	-178.25962

Points interpolated 6457, extrapolated 160; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 37.3857.

INTERFEROGRAM INFORMATION TA001003 P002 21-Jan-2000 19:09:13
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	590.6812	489.9104	03	992.3561	473.0592
02	793.7328	887.8631	04	775.4963	64.7567

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 31 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

-19.657	-0.43759	785.08
0.8167	-19.751	479.02

Transformation error: 0.0035941

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	590.204	487.118	03	991.906	470.428
02	794.197	890.575	04	775.960	67.468

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-16.25818		
*** Wedge:	30.19742	Angle:	-90.59583
*** Power:	0.56542		
*** Coma:	0.32258	Angle:	-170.39199

Points interpolated 6554, extrapolated 127; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 21.2494.

INTERFEROGRAM INFORMATION TA001003 P003 21-Jan-2000 19:09:16
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	616.5382	454.5748	03	1015.3772	450.5733
02	824.8976	870.1684	04	790.7169	49.9326

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 17 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

-19.52	-0.82018	808.91
0.20661	-19.682	456.34

Transformation error: 0.0054619

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	615.398	458.392	03	1014.303	454.170
02	826.005	866.462	04	791.825	46.226

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-8.36928		
*** Wedge:	34.36546	Angle:	177.27711
*** Power:	0.02313		
*** Coma:	0.15274	Angle:	-177.05796

Points interpolated 6492, extrapolated 167; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 37.0255.
WARNING: 1 points received non-identical, multiple estimates

INTERFEROGRAM INFORMATION TA001003 P004 21-Jan-2000 19:09:19
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	575.0031	523.0105	03	976.0844	504.4307
02	783.9549	920.9423	04	754.1888	102.3550

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 32 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

-19.627	-0.71425	769.32
0.90577	-19.642	512.82

Transformation error: 0.0016115

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	574.744	521.802	03	975.840	503.292
02	784.207	922.116	04	754.441	103.529

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-15.95246		
*** Wedge:	31.67765	Angle:	90.19337
*** Power:	0.52989		
*** Coma:	0.19367	Angle:	-173.28463

Points interpolated 6553, extrapolated 121; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 20.8291.

INTERFEROGRAM SUMMARY **********

TA/PIC	NF	Wg	Data pts	Cx	Cy	Tran Err	Rot-f angle	Int/surf ratio	WO	Data radius	Area radius
991106600	151	+	17556	402.4	397.6	0.24	R 0	1.0000	1	43.309	21.438
001003001	17	+	2172	769.5	495.8	0.47	R-175	1.0000	0	21.682	21.438
001003002	31	+	1866	785.1	479.0	0.36	R-178	1.0000	0	21.645	21.438
001003003	17	+	2377	808.9	456.3	0.55	R-177	1.0000	0	21.656	21.438
001003004	32	+	2126	769.3	512.8	0.16	R-177	1.0000	0	21.443	21.438

TA/PIC	resid high	resid low	wedge rms	power rms	coma rms	power	coma
991106600	0.755	-0.561	0.242	0.237	0.216	-0.177	0.566
001003001	0.287	-0.548	0.142	0.114	0.109	0.367	0.234
001003002	0.277	-0.688	0.181	0.120	0.110	0.565	0.323
001003003	0.237	-0.607	0.101	0.101	0.098	0.023	0.153
001003004	0.208	-0.494	0.168	0.112	0.108	0.530	0.194

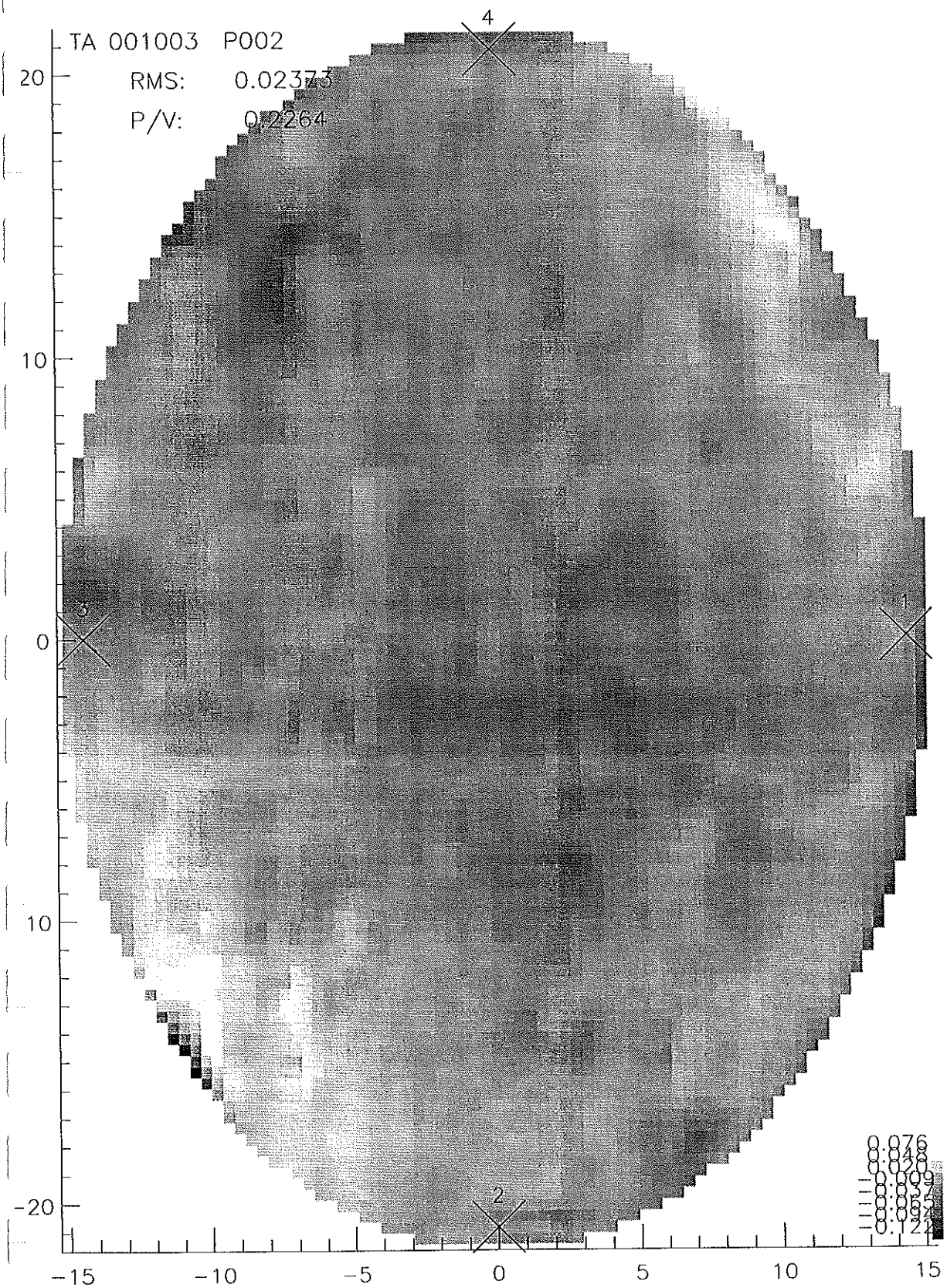
OPD SUMMARY **********

TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
991106600	82" sphere robot mid	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.172	-0.223	0.094
001003001		079	111	-15.354	-21.653	0.39370	0.39370	6681	6617	0.219	-0.170	0.066
001003002		079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.295	-0.164	0.081
001003003		079	111	-15.354	-21.653	0.39370	0.39370	6681	6659	0.141	-0.139	0.040
001003004		079	111	-15.354	-21.653	0.39370	0.39370	6681	6674	0.284	-0.167	0.079
991106100	**AVERAGE**	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.201	-0.148	0.065

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
991106600			28	59	98	100	0.047	0.042	0.041	0.041	0.041	0.038
001003001	0.013	0.982	28	68	96	99	0.053	0.021	0.021	0.019	0.018	0.018
001003002	0.020	0.987	27	68	95	99	0.056	0.022	0.020	0.019	0.018	0.018
001003003	0.033	0.908	35	68	95	99	0.039	0.022	0.020	0.019	0.018	0.018
001003004	0.018	0.988	28	68	95	99	0.055	0.021	0.018	0.017	0.016	0.016
991106100	✓	✓	28	70	95	99	0.049	0.018	0.016	0.015	0.014	0.013

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
991106600	-0.335	0.174	32.9	0.071	-16.9	-0.031	0.007	-1.7	0.157	2.9
001003001	0.082	0.312	79.9	0.045	88.9	-0.020	0.052	33.5	0.030	-40.4
001003002	0.141	0.324	80.8	0.058	114.5	-0.023	0.052	39.2	0.020	43.6
001003003	0.013	0.203	74.5	0.073	150.5	-0.019	0.049	45.1	0.018	-23.2
001003004	0.135	0.322	79.1	0.067	146.4	-0.022	0.050	51.4	0.020	-41.5
991106100	0.093	0.288	79.0	0.056	130.2	-0.021	0.049	42.5	0.017	-39.1

-90 ✓ 4


TA 001003 P002
RMS: 0.02373
P/V: 0.2264
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3
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2
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0
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5
10
15
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0.048
0.020
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-0.094
-0.122

********** INTERFEROGRAM EVALUATION PROCESS started at 24-Jan-2000 08:11:50 **********

Result TA, Picture: 999999 999 Surface TA, Picture: 991106 100
Test setup TA, Picture: 991106 200 Backout TA, Picture: 991106 600
Transform TA, Picture: 001003 005

SURFACE INFORMATION TA991106 P100 24-Jan-2000 08:11:50
TITLE: Magellan Tertiary Mirror S/N 2 - Full Optical Aperture

Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	14.4375	0.0000	03	-14.4375	0.0000
02	0.0000	-20.8375	04	0.0000	20.8375

Reference wavelength: 6328

Grid points: X: 79 Y: 111 Grid increments: X: 0.393700 Y: 0.393700
Grid start: X:-15.354300 Y:-21.653500

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	0.000	0.000	30.497	43.289	0.000

Obstructions (0) ----------

TEST SETUP INFORMATION TA991106 P200 24-Jan-2000 08:11:50

Base length: 343.0640
Central displacement X: 0.0000 Y: 0.0000
Angle of incidence: 45.0000
Surface rotation: -90.0000

INTERFEROGRAM PROCESSING PARAMETERS
Wavefront passes: 4 Averaging type: unweighted Area: total
Design residual: 0 Mapping error: 0
Focus model: wedge

INTERFEROGRAM PROCESSED
TA 001003 Picture 005
TA 001003 Picture 006

TA 001003 Picture 007
TA 001003 Picture 008

INTERFEROGRAM INFORMATION TA991106 P600 24-Jan-2000 08:11:50
TITLE: 82" sphere robot middle fids (10.625"radius)

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	325.1415	474.8585	03	474.8585	325.1415
02	474.8585	474.8585	04	325.1415	325.1415

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 151 Wedge: Plus (+)

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	400.000	400.000	800.000	800.000	0.000

Obstructions (0) ----------

Transform coefficients (interferogram->pupil) for transform interferogram

-0.0015093	-0.035034	17.644
0.03495	-0.000353	-25.639

Transformation error: 0.00208

Transform coefficients (pupil->interferogram) for backout interferogram

10.875	-0.39741	395.1
0.72935	11.055	389.54

Transformation error: 0.0021715

Transformed backout pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	325.351	474.610	03	475.065	324.896
02	474.651	475.106	04	324.934	325.389

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-0.01470		
*** Wedge:	0.10180	Angle:	27.61493
*** Power:	-0.23203		
*** Coma:	0.65891	Angle:	20.57651

Points interpolated 6681, extrapolated 0; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 5.26269.

INTERFEROGRAM INFORMATION TA001003 P005 24-Jan-2000 08:11:59
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	325.5899	491.2762	03	1151.4091	455.6978
02	742.6403	909.4320	04	734.1234	66.9903

Reference Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	971.7277	636.3709	03	555.6127	276.3650
02	943.2181	246.6121	04	586.8415	668.0901

Test wavelength: 6328 Fringes: 21 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

-0.28804	28.6	738.35
-28.53	-1.2322	471.81

Transformation error: 0.002091

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	325.440	489.595	03	1151.259	454.016
02	742.784	911.042	04	734.280	68.745

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-10.82179		
*** Wedge:	22.61595	Angle:	90.47564
*** Power:	-0.30365		
*** Coma:	0.22199	Angle:	-95.99089

Points interpolated 6582, extrapolated 63; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 41.2012.
WARNING: 1 points received non-identical, multiple estimates

INTERFEROGRAM INFORMATION TA001003 P006 24-Jan-2000 08:12:02
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	301.1107	484.6400	03	1131.8719	471.1942
02	696.4131	929.9074	04	732.4261	84.7398

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 24 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

1.2217	28.771	715.84
-28.644	-0.46567	483.54

Transformation error: 0.0069866

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	300.463	490.264	03	1131.223	476.817
02	697.034	924.526	04	733.103	78.875

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-12.31532		
*** Wedge:	26.56403	Angle:	-0.97151
*** Power:	-0.09578		
*** Coma:	0.14307	Angle:	-82.62360

Points interpolated 6450, extrapolated 157; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 35.4118.
WARNING: 1 points received non-identical, multiple estimates

INTERFEROGRAM INFORMATION TA001003 P007 24-Jan-2000 08:12:05
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	327.9509	512.2798	03	1150.8383	486.2968
02	738.5002	944.2061	04	738.0830	96.9662

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 20 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

-0.012515	28.498	738.84
-28.702	-0.89986	500.84

Transformation error: 0.0020341

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	327.396	513.831	03	1150.283	487.847
02	739.032	942.722	04	738.662	95.349

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-9.78270		
*** Wedge:	20.54848	Angle:	-93.28147
*** Power:	-0.31594		
*** Coma:	0.21112	Angle:	-100.88008

Points interpolated 6580, extrapolated 100; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 43.1218.
WARNING: 1 points received non-identical, multiple estimates

INTERFEROGRAM INFORMATION TA001003 P008 24-Jan-2000 08:12:07
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	318.6000	510.6660	03	1151.6920	478.9270
02	731.2326	945.8167	04	747.1985	100.4747

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 28 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

0.53438	28.852	737.35
-28.648	-1.0992	499.89

Transformation error: 0.0068628

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	320.805	515.760	03	1153.896	484.020
02	729.123	940.942	04	744.900	95.163

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-14.39532		
*** Wedge:	29.57153	Angle:	177.73059
*** Power:	-0.07182		
*** Coma:	0.15527	Angle:	-114.61377

Points interpolated 6553, extrapolated 125; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 30.9803.

INTERFEROGRAM SUMMARY **********

TA/PIC	NF	Wg	Data pts	Cx	Cy	Tran Err	Rot-f angle	Int/surf ratio	WO	Data radius	Area radius
991106600	151	+	17556	395.1	389.5	0.22	R 87	1.0000	1	40.222	21.438
001003005	21	+	1994	738.3	471.8	0.21	R 180	1.0000	0	21.062	21.438
001003006	24	+	2675	715.8	483.5	0.70	R 177	1.0000	0	19.010	21.438
001003007	20	+	1625	738.8	500.8	0.20	R 180	1.0000	0	19.748	21.438
001003008	28	+	3278	737.4	499.9	0.69	R 178	1.0000	0	19.379	21.438

TA/PIC	resid high	resid low	wedge rms	power rms	coma rms	power	coma
991106600	0.781	-0.520	0.243	0.238	0.211	-0.232	0.659
001003005	0.217	-1.231	0.139	0.114	0.109	-0.304	0.222
001003006	0.321	-0.594	0.091	0.087	0.084	-0.096	0.143
001003007	0.268	-0.730	0.132	0.099	0.093	-0.316	0.211
001003008	0.186	-0.478	0.081	0.078	0.074	-0.072	0.155

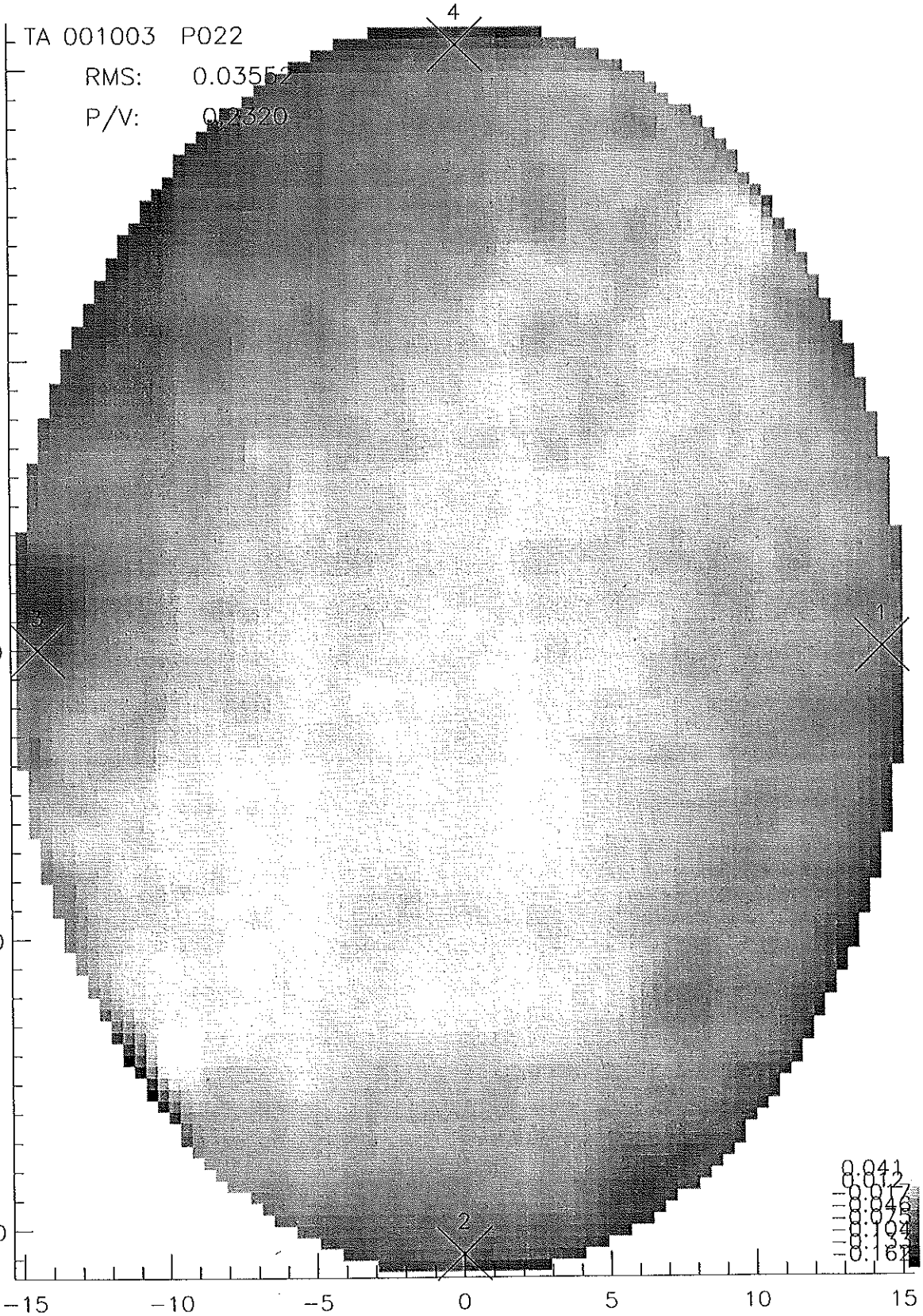
OPD SUMMARY **********

TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
991106600	82" sphere robot mid	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.200	-0.337	0.108
001003005		079	111	-15.354	-21.653	0.39370	0.39370	6681	6645	0.120	-0.292	0.026
001003006		079	111	-15.354	-21.653	0.39370	0.39370	6681	6607	0.156	-0.144	0.033
001003007		079	111	-15.354	-21.653	0.39370	0.39370	6681	6680	0.123	-0.228	0.029
001003008		079	111	-15.354	-21.653	0.39370	0.39370	6681	6678	0.128	-0.108	0.031
991106100	**AVERAGE**	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.090	-0.136	0.024

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
991106600			35	66	95	99	0.058	0.049	0.044	0.036	0.036	0.035
001003005	0.018	0.741	44	73	95	99	0.026	0.023	0.023	0.023	0.022	0.022
001003006	0.017	0.864	40	70	94	99	0.029	0.021	0.021	0.020	0.020	0.019
001003007	0.020	0.732	43	71	94	99	0.029	0.025	0.025	0.025	0.024	0.024
001003008	0.018	0.820	36	66	96	99	0.023	0.021	0.021	0.019	0.019	0.019
991106100	✓	✓	40	70	94	99	0.021	0.016	0.016	0.015	0.015	0.015

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
991106600	-0.468	0.191	-57.9	0.114	104.9	-0.101	0.017	-57.0	0.099	6.2
001003005	0.019	0.085	36.0	0.027	139.6	-0.015	0.037	36.3	0.012	9.1
001003006	0.104	0.119	23.1	0.022	-125.9	-0.014	0.028	-44.5	0.039	-41.5
001003007	0.013	0.100	35.5	0.017	26.0	-0.012	0.023	41.7	0.026	38.2
001003008	0.078	0.062	45.3	0.035	-32.7	-0.025	0.033	-13.4	0.007	40.1
991106100	0.052	0.087	34.4	0.006	-30.2	-0.017	0.004	42.2	0.018	41.4

Full Ap. Combo 3&4



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result ta, picture: 999999 999
orientation #1 ta, picture: 1003 3
orientation #2 ta, picture: 1003 4
test setup #1 ta, picture: 991106 300
test setup #2 ta, picture: 991106 400

surface ta, picture: 991106 100

SURFACE INFORMATION TA001003 P003 24-Jan-2000 08:49:40
TITLE: Magellan Tertiary Mirror S/N 2 - Full Optical Aperture

Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	14.4375	0.0000	03	-14.4375	0.0000
02	0.0000	-20.8375	04	0.0000	20.8375

Reference wavelength: 6328

Grid points: X: 79 Y: 111 Grid increments: X: 0.393700 Y: 0.393700
Grid start: X:-15.354300 Y:-21.653500

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	0.000	0.000	30.497	43.289	0.000

Obstructions (0) ----------

SURFACE INFORMATION TA001003 P004 24-Jan-2000 08:49:40
TITLE: Magellan Tertiary Mirror S/N 2 - Full Optical Aperture

Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	14.4375	0.0000	03	-14.4375	0.0000
02	0.0000	-20.8375	04	0.0000	20.8375

Reference wavelength: 6328

Grid points: X: 79 Y: 111 Grid increments: X: 0.393700 Y: 0.393700
Grid start: X:-15.354300 Y:-21.653500

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	0.000	0.000	30.497	43.289	0.000

Obstructions (0) ----------

TEST SETUP INFORMATION TA991106 P300 24-Jan-2000 08:49:40

Base length:	343.0640			
Central displacement	X: 0.0000		Y:	0.0000
Angle of incidence:	45.0000			
Surface rotation:	180.0000			

TEST SETUP INFORMATION TA991106 P400 24-Jan-2000 08:49:40

Base length:	343.0640			
Central displacement	X: 0.0000		Y:	0.0000
Angle of incidence:	45.0000			
Surface rotation:	90.0000			

Difference array between input, unfocused arrays ----------
peak: 0.1792 valley: -0.0963 rms: 0.0481

Special surface 1 coefficients:
0.053773, -0.000258, 0.000146, -0.001569
Special surface 2 coefficients:
-0.053774, -0.000111, -0.000369, -0.001043
(models: c1 + c2*x + c3*y + c4*(x^2+y^2)
[in the two pupil planes, aperture not normalized]

Difference array between refocused arrays ----------
peak: 0.1274 valley: -0.0772 rms: 0.0161

Coefficients of final wedge model removed
*** Bias: -0.06206
*** Wedge: 0.00602 Angle: -158.40976

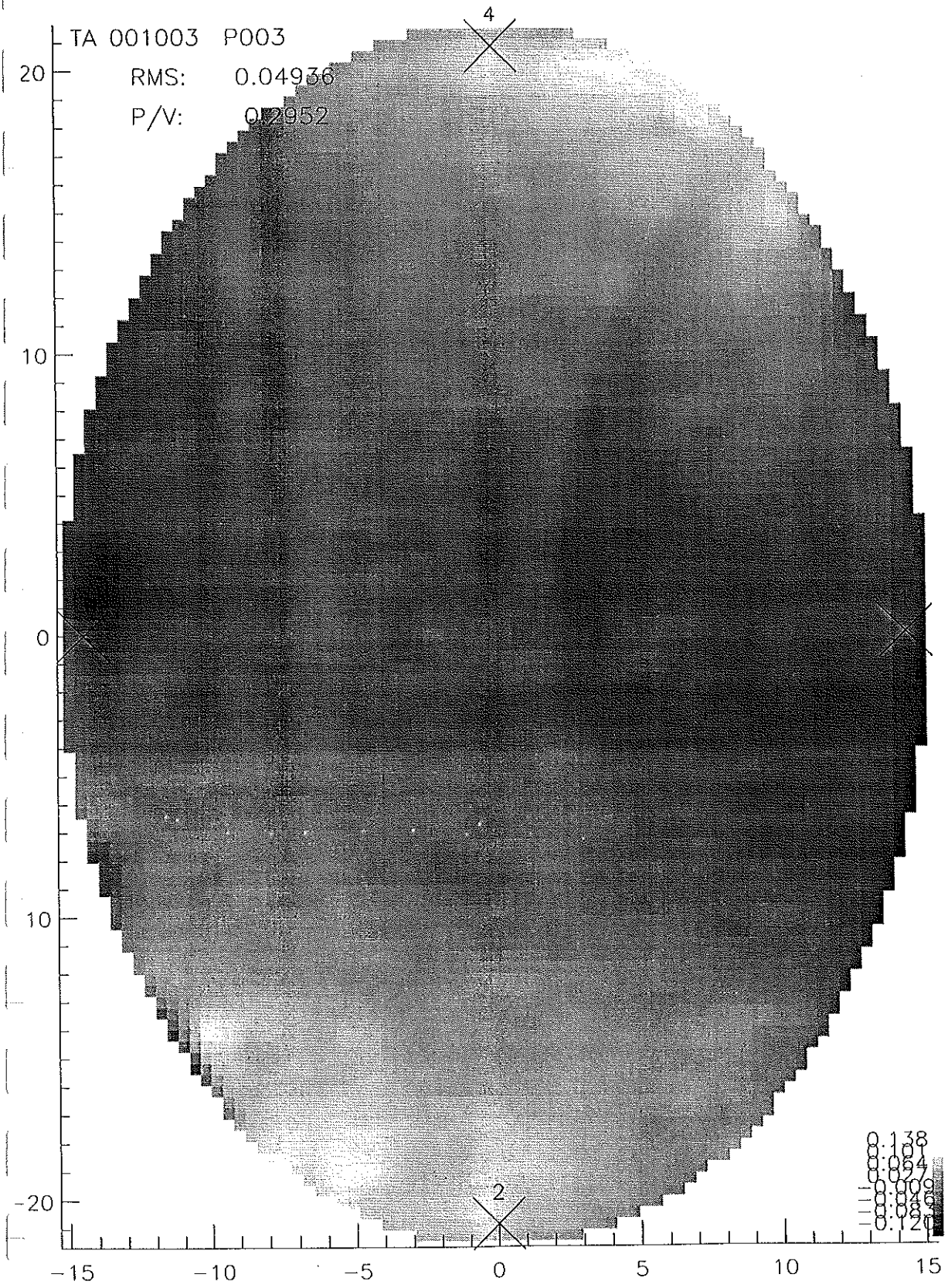
OPD SUMMARY **********

TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003003	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.157	-0.139	0.049
001003004	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.089	-0.164	0.023
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.056	-0.176	0.036

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003003			30	69	95	99	0.044	0.016	0.015	0.013	0.013	0.013
001003004			41	72	94	99	0.023	0.018	0.016	0.015	0.015	0.014
999999999			32	70	94	99	0.027	0.015	0.014	0.012	0.012	0.012

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003003	0.033	0.271	75.4	0.034	37.9	-0.022	0.011	40.1	0.028	42.6
001003004	-0.028	0.104	51.2	0.046	103.3	-0.019	0.039	57.8	0.020	30.6
999999999	-0.153	0.159	66.5	0.032	79.3	-0.020	0.022	54.4	0.022	37.6

180 V / V


TA 001003 P003
RMS: 0.04936
P/V: 0.2952
4
2
20
10
0
10
-20
-15
-10
-5
0
5
10
15
0.138
0.101
0.064
0.027
-0.009
-0.046
-0.083
-0.120

********** INTERFEROGRAM EVALUATION PROCESS started at 24-Jan-2000 08:47:07 **********

Result TA, Picture: 999999 999 Surface TA, Picture: 991106 100
Test setup TA, Picture: 991106 300 Backout TA, Picture: 991106 600
Transform TA, Picture: 001003 009

SURFACE INFORMATION TA991106 P100 24-Jan-2000 08:47:07
TITLE: Magellan Tertiary Mirror S/N 2 - Full Optical Aperture

Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	14.4375	0.0000	03	-14.4375	0.0000
02	0.0000	-20.8375	04	0.0000	20.8375

Reference wavelength: 6328

Grid points: X: 79 Y: 111 Grid increments: X: 0.393700 Y: 0.393700
Grid start: X:-15.354300 Y:-21.653500

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	0.000	0.000	30.497	43.289	0.000

Obstructions (0) ----------

TEST SETUP INFORMATION TA991106 P300 24-Jan-2000 08:47:07

Base length: 343.0640
Central displacement X: 0.0000 Y: 0.0000
Angle of incidence: 45.0000
Surface rotation: 180.0000

INTERFEROGRAM PROCESSING PARAMETERS
Wavefront passes: 4 Averaging type: unweighted Area: total
Design residual: 0 Mapping error: 0
Focus model: wedge

INTERFEROGRAM PROCESSED
TA 001003 Picture 009
TA 001003 Picture 010

TA 001003 Picture 011
TA 001003 Picture 012

INTERFEROGRAM INFORMATION TA991106 P600 24-Jan-2000 08:47:07
TITLE: 82" sphere robot middle fids (10.625"radius)

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	325.1415	474.8585	03	474.8585	325.1415
02	474.8585	474.8585	04	325.1415	325.1415

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 151 Wedge: Plus (+)

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	400.000	400.000	800.000	800.000	0.000

Obstructions (0) ----------

Transform coefficients (interferogram->pupil) for transform interferogram

0.051861	-0.0020279	-42.567
-0.00020867	0.050287	-27.641

Transformation error: 0.0041776

Transform coefficients (pupil->interferogram) for backout interferogram

10.775	0.10957	389.23
0.34025	11.177	397.68

Transformation error: 0.00096858

Transformed backout pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	325.244	474.756	03	474.961	325.040
02	474.756	474.960	04	325.039	325.243

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-0.01530		
*** Wedge:	0.09399	Angle:	19.57355
*** Power:	-0.23593		
*** Coma:	0.58149	Angle:	25.38435

Points interpolated 6681, extrapolated 0; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 5.26269.

INTERFEROGRAM INFORMATION TA001003 P009 24-Jan-2000 08:47:14
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	639.2523	549.0670	03	1033.3545	550.4951
02	858.8915	970.8824	04	826.4915	142.1211

Reference Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	732.0151	693.4709	03	991.9538	419.6721
02	999.3903	686.5403	04	723.8646	427.3474

Test wavelength: 6328 Fringes: 17 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

19.286	0.77745	842.43
0.07963	19.886	553.15

Transformation error: 0.0042161

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	639.506	552.316	03	1033.624	553.943
02	858.630	967.534	04	826.229	138.773

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-8.96913		
*** Wedge:	35.21749	Angle:	179.40109
*** Power:	0.16171		
*** Coma:	0.05218	Angle:	-125.10295

Points interpolated 6590, extrapolated 86; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 37.2943.

INTERFEROGRAM INFORMATION TA001003 P010 24-Jan-2000 08:47:17
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	1040.8400	501.0949	03	637.7931	514.9059
02	810.9988	89.1079	04	855.3481	917.8958

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 26 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

-19.723	-1.0642	833.25
0.66898	-19.887	505.85

Transformation error: 0.002927

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	1040.769	498.814	03	637.718	512.485
02	811.072	91.459	04	855.421	920.247

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-13.67456		
*** Wedge:	25.50148	Angle:	-89.08755
*** Power:	0.65606		
*** Coma:	0.06903	Angle:	99.79380

Points interpolated 6545, extrapolated 136; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 25.3149.

INTERFEROGRAM INFORMATION TA001003 P011 24-Jan-2000 08:47:19
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	635.0219	513.0289	03	1038.4556	495.0680
02	857.7134	916.0303	04	828.1760	89.7754

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 16 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

19.742	0.70876	842.84
-0.88017	19.826	503.34

Transformation error: 0.00060546

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	635.120	512.603	03	1038.560	494.616
02	857.612	916.469	04	828.074	90.214

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-8.73541		
*** Wedge:	32.31523	Angle:	-0.09417
*** Power:	-0.73034		
*** Coma:	0.11455	Angle:	-135.94427

Points interpolated 6390, extrapolated 194; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 39.5069.

INTERFEROGRAM INFORMATION TA001003 P012 24-Jan-2000 08:47:22
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	624.5590	536.7792	03	1027.9564	501.7603
02	849.1322	927.2078	04	813.4727	100.4949

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 33 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

19.738	0.85566	831.78
-1.7207	19.837	516.3

Transformation error: 0.0032843

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	624.095	534.404	03	1027.464	499.240
02	849.611	929.655	04	813.951	102.942

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-17.18062		
*** Wedge:	32.18379	Angle:	-89.69596
*** Power:	0.35711		
*** Coma:	0.06293	Angle:	-130.50191

Points interpolated 6618, extrapolated 62; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 20.6212.

INTERFEROGRAM SUMMARY **********

TA/PIC	NF	W g	Data pts	Cx	Cy	Tran Err	Rot-f angle	Int/surf ratio	WO	Data radius	Area radius
991106600	151	+	17556	389.2	397.7	0.10	R-179	1.0000	1	58.739	21.438
001003009	17	+	2435	842.4	553.2	0.42	R-177	1.0000	0	21.971	21.438
001003010	26	+	1478	833.2	505.9	0.29	R-356	1.0000	0	21.335	21.438
001003011	16	+	2017	842.8	503.3	0.06	R-177	1.0000	0	21.832	21.438
001003012	33	+	2157	831.8	516.3	0.33	R-177	1.0000	0	21.507	21.438

TA/PIC	resid high	resid low	wedge rms	power rms	coma rms	power	coma
991106600	0.784	-0.499	0.243	0.237	0.217	-0.236	0.581
001003009	0.309	-0.605	0.108	0.101	0.101	0.162	0.052
001003010	0.252	-0.521	0.196	0.110	0.109	0.656	0.069
001003011	0.287	-0.656	0.197	0.113	0.111	-0.730	0.115
001003012	0.371	-0.629	0.150	0.122	0.122	0.357	0.063

OPD SUMMARY **********

TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
991106600	82" sphere robot mid	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.181	-0.227	0.096
001003009		079	111	-15.354	-21.653	0.39370	0.39370	6681	6676	0.206	-0.141	0.052
001003010		079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.272	-0.159	0.091
001003011		079	111	-15.354	-21.653	0.39370	0.39370	6681	6584	0.121	-0.234	0.045
001003012		079	111	-15.354	-21.653	0.39370	0.39370	6681	6680	0.243	-0.242	0.069
991106100	**AVERAGE**	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.157	-0.139	0.049

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
991106600			30	60	98	100	0.053	0.049	0.041	0.042	0.041	0.038
001003009	0.013	0.968	29	70	95	99	0.042	0.018	0.018	0.017	0.017	0.016
001003010	0.047	0.948	27	68	95	100	0.060	0.020	0.018	0.016	0.016	0.016
001003011	0.072	-0.170	36	71	95	99	0.031	0.021	0.020	0.019	0.019	0.019
001003012	0.024	0.974	28	69	95	99	0.055	0.021	0.021	0.019	0.019	0.018
991106100			30	69	95	99	0.044	0.016	0.015	0.013	0.013	0.013

Pic 11

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
991106600	-0.339	0.164	31.3	0.163	174.1	-0.030	0.072	-59.3	0.149	1.3
001003009	0.060	0.244	77.1	0.032	16.9	-0.016	0.007	17.4	0.033	-36.8
001003010	0.167	0.365	78.9	0.054	23.0	-0.023	0.006	20.7	0.032	40.9
001003011	-0.181	0.156	61.1	0.038	57.1	-0.024	0.022	49.2	0.012	23.5
001003012	0.089	0.331	76.4	0.028	49.5	-0.024	0.016	29.3	0.045	40.2
991106100	0.033	0.271	75.4	0.034	37.9	-0.022	0.011	40.1	0.028	42.6

+90 ✓

********** INTERFEROGRAM EVALUATION PROCESS started at 24-Jan-2000 08:14:43 **********

Result TA, Picture: 999999 999 Surface TA, Picture: 991106 100
Test setup TA, Picture: 991106 400 Backout TA, Picture: 991106 600
Transform TA, Picture: 001003 013

SURFACE INFORMATION TA991106 P100 24-Jan-2000 08:14:43
TITLE: Magellan Tertiary Mirror S/N 2 - Full Optical Aperture

Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	14.4375	0.0000	03	-14.4375	0.0000
02	0.0000	-20.8375	04	0.0000	20.8375

Reference wavelength: 6328

Grid points: X: 79 Y: 111 Grid increments: X: 0.393700 Y: 0.393700
Grid start: X:-15.354300 Y:-21.653500

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	0.000	0.000	30.497	43.289	0.000

Obstructions (0) ----------

TEST SETUP INFORMATION TA991106 P400 24-Jan-2000 08:14:43

Base length: 343.0640
Central displacement X: 0.0000 Y: 0.0000
Angle of incidence: 45.0000
Surface rotation: 90.0000

INTERFEROGRAM PROCESSING PARAMETERS
Wavefront passes: 4 Averaging type: unweighted Area: total
Design residual: 0 Mapping error: 0
Focus model: wedge

INTERFEROGRAM PROCESSED
TA 001003 Picture 013
TA 001003 Picture 014

TA 001003 Picture 015
TA 001003 Picture 016

INTERFEROGRAM INFORMATION TA991106 P600 24-Jan-2000 08:14:43
TITLE: 82" sphere robot middle fids (10.625"radius)

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	325.1415	474.8585	03	474.8585	325.1415
02	474.8585	474.8585	04	325.1415	325.1415

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 151 Wedge: Plus (+)

Windows (1) ----------

No.	Shape	Center X	Center Y	Length	Width	Angle
1	Ellipse	400.000	400.000	800.000	800.000	0.000

Obstructions (0) ----------

Transform coefficients (interferogram->pupil) for transform interferogram
0.00023876 0.034777 -18.574
-0.03477 0.0011627 25.56
Transformation error: 0.0030045

Transform coefficients (pupil->interferogram) for backout interferogram
10.988 0.22325 396.11
-0.51307 11.011 408.79
Transformation error: 0.0010034

Transformed backout pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	325.174	475.005	03	474.891	325.288
02	474.826	474.712	04	325.109	324.995

Coefficients of interferogram COMA MODEL removed during interpolation
*** Bias: -0.00647
*** Wedge: 0.05875 Angle: -2.12801
*** Power: -0.19142
*** Coma: 0.47936 Angle: 18.53666

Points interpolated 6681, extrapolated 0; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 5.26269.

INTERFEROGRAM INFORMATION TA001003 P013 24-Jan-2000 08:14:50
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	335.6504	530.3932	03	1165.8715	524.6675
02	768.4809	936.4691	04	739.9539	87.6485

Reference Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	582.3674	341.1232	03	968.0724	737.8214
02	577.9818	732.4107	04	973.9908	346.2166

Test wavelength: 6328 Fringes: 21 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

0.96035	-28.752	752.79
28.747	0.19831	528.91

Transformation error: 0.0030631

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	337.683	531.770	03	1167.904	526.044
02	766.361	935.033	04	738.008	86.331

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-10.98629		
*** Wedge:	22.77190	Angle:	-90.69141
*** Power:	0.33671		
*** Coma:	0.02544	Angle:	-130.87062

Points interpolated 6476, extrapolated 115; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 40.5671.

INTERFEROGRAM INFORMATION TA001003 P014 24-Jan-2000 08:14:54
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	408.0436	610.4791	03	1220.0284	460.2468
02	894.8840	931.9720	04	725.8658	103.6487

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 24 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

5.725	-28.121	814.02
28.056	5.2029	535.48

Transformation error: 0.00014936

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	408.028	610.597	03	1220.012	460.364
02	894.901	931.849	04	725.881	103.536

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-12.76958		
*** Wedge:	25.59911	Angle:	178.23131
*** Power:	-0.48356		
*** Coma:	0.04351	Angle:	-122.77612

Points interpolated 6610, extrapolated 66; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 37.8927.

INTERFEROGRAM INFORMATION TA001003 P015 24-Jan-2000 08:14:57
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	390.8396	588.2565	03	1211.5773	498.4329
02	842.7741	947.0776	04	743.8364	104.9613

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 26 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

3.3596	-28.424	798.32
28.523	3.1108	543.72

Transformation error: 0.0036981

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	387.953	588.636	03	1208.690	498.812
02	845.785	946.682	04	746.599	104.598

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-12.37910		
*** Wedge:	26.73783	Angle:	90.03863
*** Power:	-0.94317		
*** Coma:	0.04674	Angle:	52.83253

Points interpolated 6646, extrapolated 35; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 33.6909.

INTERFEROGRAM INFORMATION TA001003 P016 24-Jan-2000 08:15:00
TITLE:

Test Fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	376.5659	527.8227	03	1204.5215	513.2894
02	806.2961	933.9620	04	774.3786	83.3405

Reference Fiducial marks (0) ----------

Test wavelength: 6328 Fringes: 32 Wedge: Plus (+)

Windows (0) ----------

Obstructions (0) ----------

Transform coefficients (pupil->interferogram) for test interferogram

1.0804	-28.674	790.78
28.803	0.50333	523.73

Transformation error: 0.0039081

Transformed pupil fiducial marks (4) ----------

Number	X	Y	Number	X	Y
01	376.805	531.001	03	1204.760	516.467
02	806.047	930.648	04	774.149	80.299

Coefficients of interferogram COMA MODEL removed during interpolation

*** Bias:	-16.18743		
*** Wedge:	34.97940	Angle:	-0.92722
*** Power:	-0.34606		
*** Coma:	0.01569	Angle:	-149.29701

Points interpolated 6493, extrapolated 138; interior points estimated with surface fit 0;
triangle eccentricity threshold 1e+10, area threshold 1e+10; average fringe spacing 26.5959.

INTERFEROGRAM SUMMARY **********

TA/PIC	NF	W g	Data pts	Cx	Cy	Tran Err	Rot-f angle	Int/surf ratio	WO	Data radius	Area radius
991106600	151	+	17556	396.1	408.8	0.10	R -88	1.0000	1	46.286	21.438
001003013	21	+	2523	752.8	528.9	0.31	R-178	1.0000	0	19.491	21.438
001003014	24	+	2793	814.0	535.5	0.01	R-168	1.0000	0	20.268	21.438
001003015	26	+	3052	798.3	543.7	0.37	R-173	1.0000	0	17.404	21.438
001003016	32	+	4545	790.8	523.7	0.39	R-177	1.0000	0	19.410	21.438

TA/PIC	resid high	resid low	wedge rms	power rms	coma rms	power	coma
991106600	0.750	-0.536	0.242	0.237	0.223	-0.191	0.479
001003013	0.277	-0.660	0.122	0.087	0.087	0.337	0.025
001003014	0.455	-0.604	0.148	0.088	0.088	-0.484	0.044
001003015	0.292	-0.704	0.260	0.083	0.082	-0.943	0.047
001003016	0.263	-0.498	0.117	0.075	0.075	-0.346	0.016

OPD SUMMARY **********

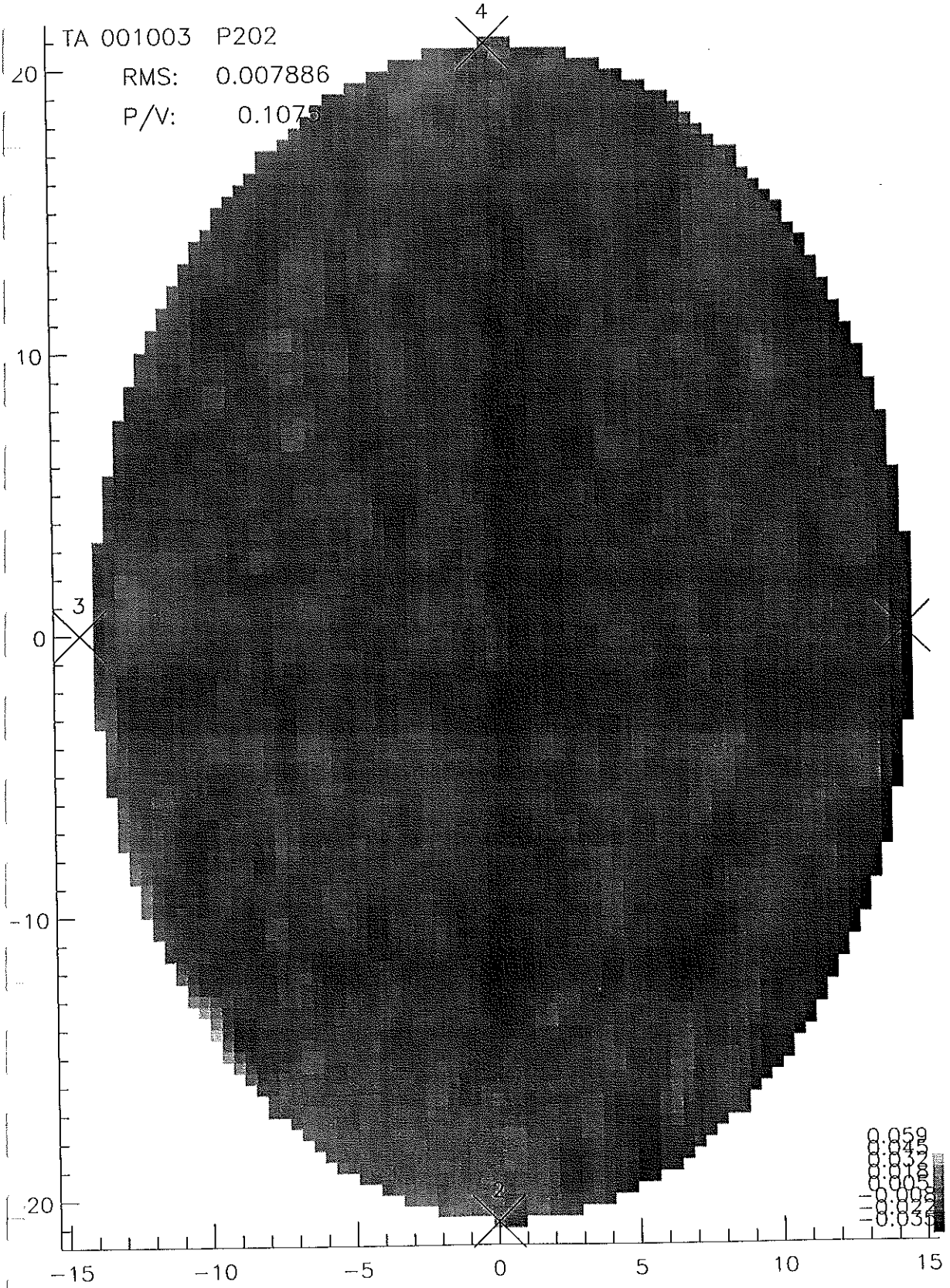
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
991106600	82" sphere robot mid	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.186	-0.361	0.112
001003013		079	111	-15.354	-21.653	0.39370	0.39370	6681	6591	0.213	-0.137	0.066
001003014		079	111	-15.354	-21.653	0.39370	0.39370	6681	6676	0.157	-0.218	0.028
001003015		079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.150	-0.318	0.062
001003016		079	111	-15.354	-21.653	0.39370	0.39370	6681	6631	0.120	-0.226	0.025
991106100	**AVERAGE**	079	111	-15.354	-21.653	0.39370	0.39370	6681	6681	0.089	-0.164	0.023

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
991106600			36	65	95	99	0.058	0.049	0.044	0.036	0.035	0.035
001003013	0.063	0.305	30	62	97	99	0.043	0.024	0.022	0.021	0.021	0.021
001003014	0.016	0.811	39	73	95	98	0.027	0.022	0.019	0.018	0.018	0.017
001003015	0.056	0.433	34	65	96	99	0.040	0.023	0.022	0.021	0.021	0.020
001003016	0.014	0.841	41	73	95	99	0.026	0.021	0.019	0.019	0.018	0.018
991106100			41	72	94	99	0.023	0.018	0.016	0.015	0.015	0.014

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
991106600	-0.470	0.194	-52.4	0.103	-102.5	-0.101	0.039	35.3	0.081	6.3
001003013	0.289	0.231	15.9	0.064	90.4	-0.017	0.035	53.0	0.014	18.7
001003014	-0.065	0.104	56.6	0.067	114.0	-0.013	0.047	58.0	0.011	34.2
001003015	-0.296	0.221	77.8	0.032	129.4	-0.020	0.038	-49.1	0.033	23.6
001003016	-0.014	0.099	52.4	0.052	87.4	-0.007	0.045	-60.0	0.014	19.6
991106100	-0.028	0.104	51.2	0.046	103.3	-0.019	0.039	57.8	0.020	30.6

Δ (Avg − X Axis 2cm Shear)

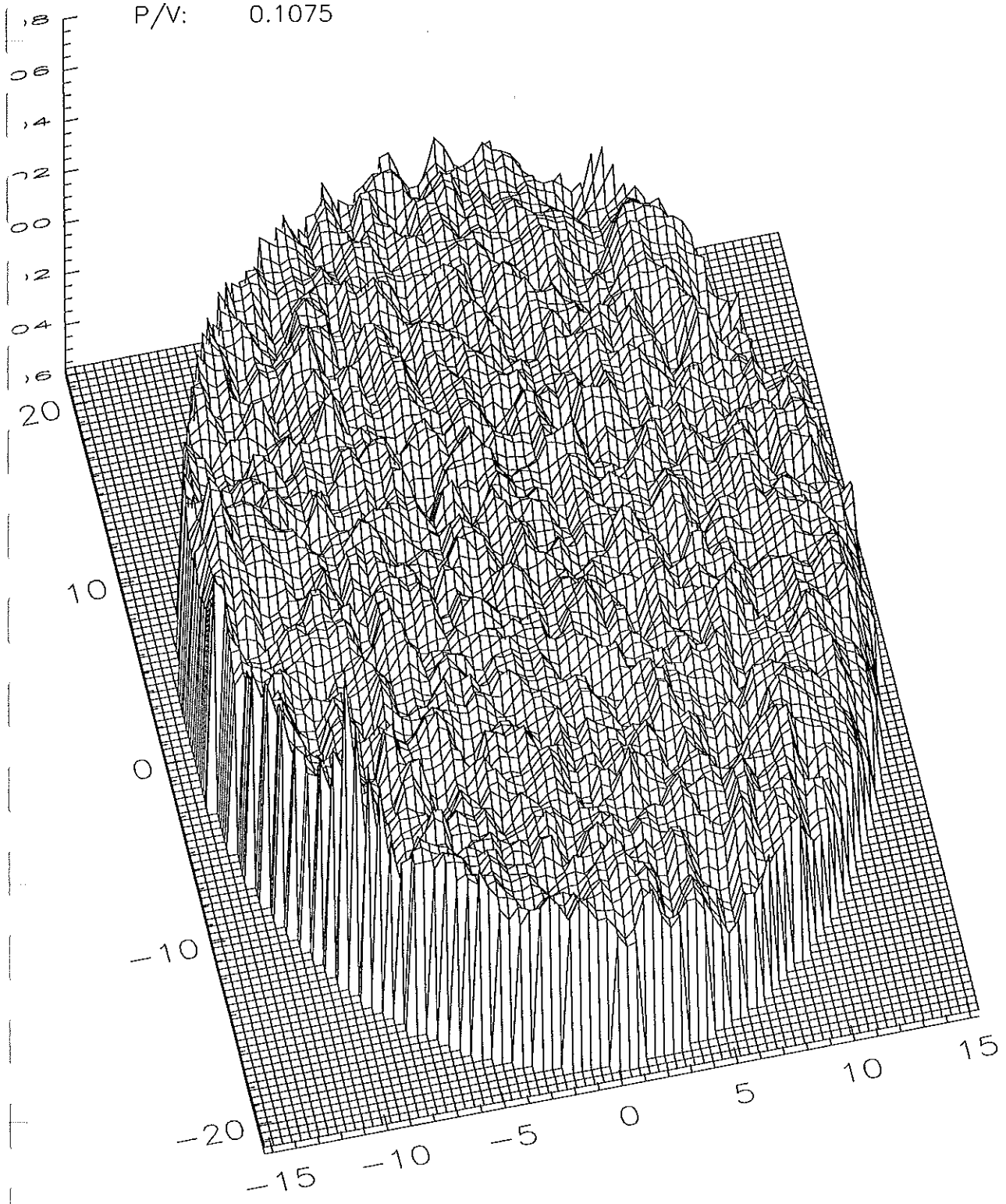
Spec- .02372 RMS



TA 001003 P202 OPD array

RMS: 0.007886

P/V: 0.1075



********** WAVEFRONT COMBINATION PROCESS started at 0001241003 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	102	--	--	-1.0000	none

OPD SUMMARY **********

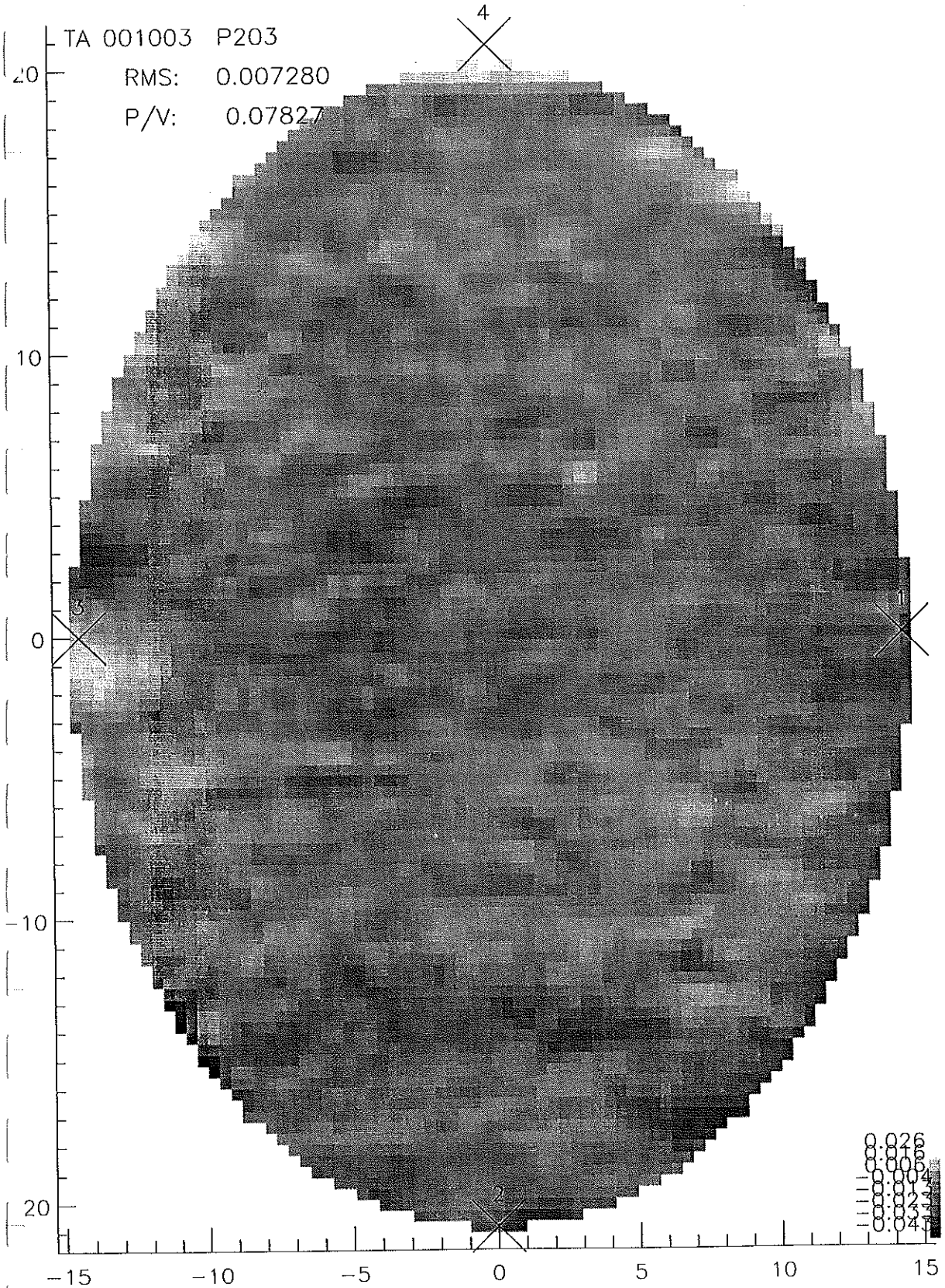
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003102	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	6039	0.065	-0.042	0.008

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2 1S 2S 3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.028	0.328	30 67 95 99	0.023	0.011	0.011	0.010	0.010	0.009
001003102	0.029	0.255	30 67 95 99	0.023	0.011	0.011	0.010	0.010	0.009
999999999			45 76 94 98	0.007	0.007	0.006	0.006	0.006	0.006

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003102	-0.131	0.140	66.5	0.021	76.0	-0.011	0.009	43.6	0.036	43.1
999999999	-0.003	0.005	67.2	0.019	178.1	-0.002	0.012	58.8	0.006	-14.8

Δ (Avg. – Y Axis 2cm Shear)

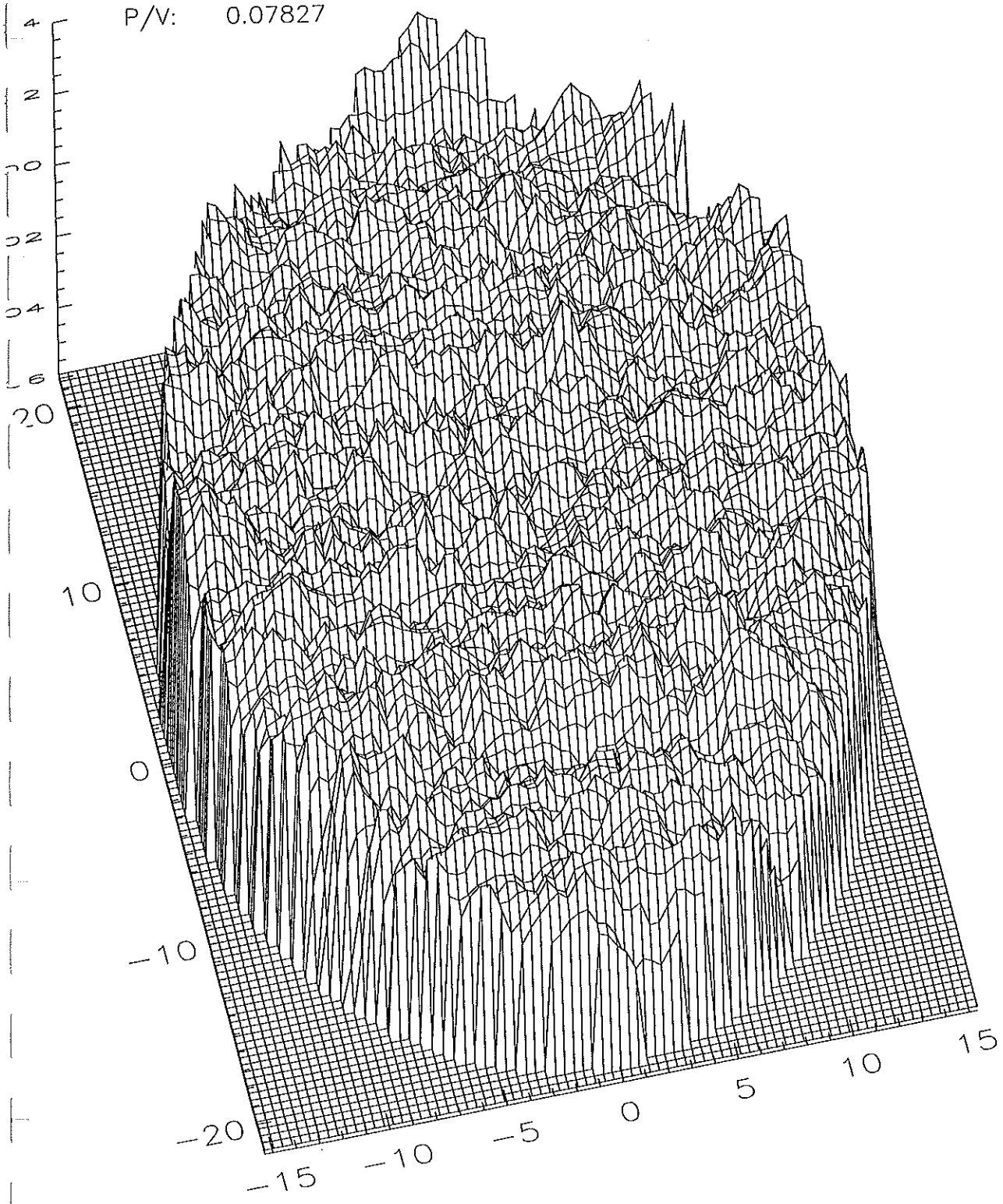
Spec. .02372RMS



TA 001003 P203 OPD array

RMS: 0.007280

P/V: 0.07827



********** WAVEFRONT COMBINATION PROCESS started at 0001241005 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	103	--	--	-1.0000	none

OPD SUMMARY **********

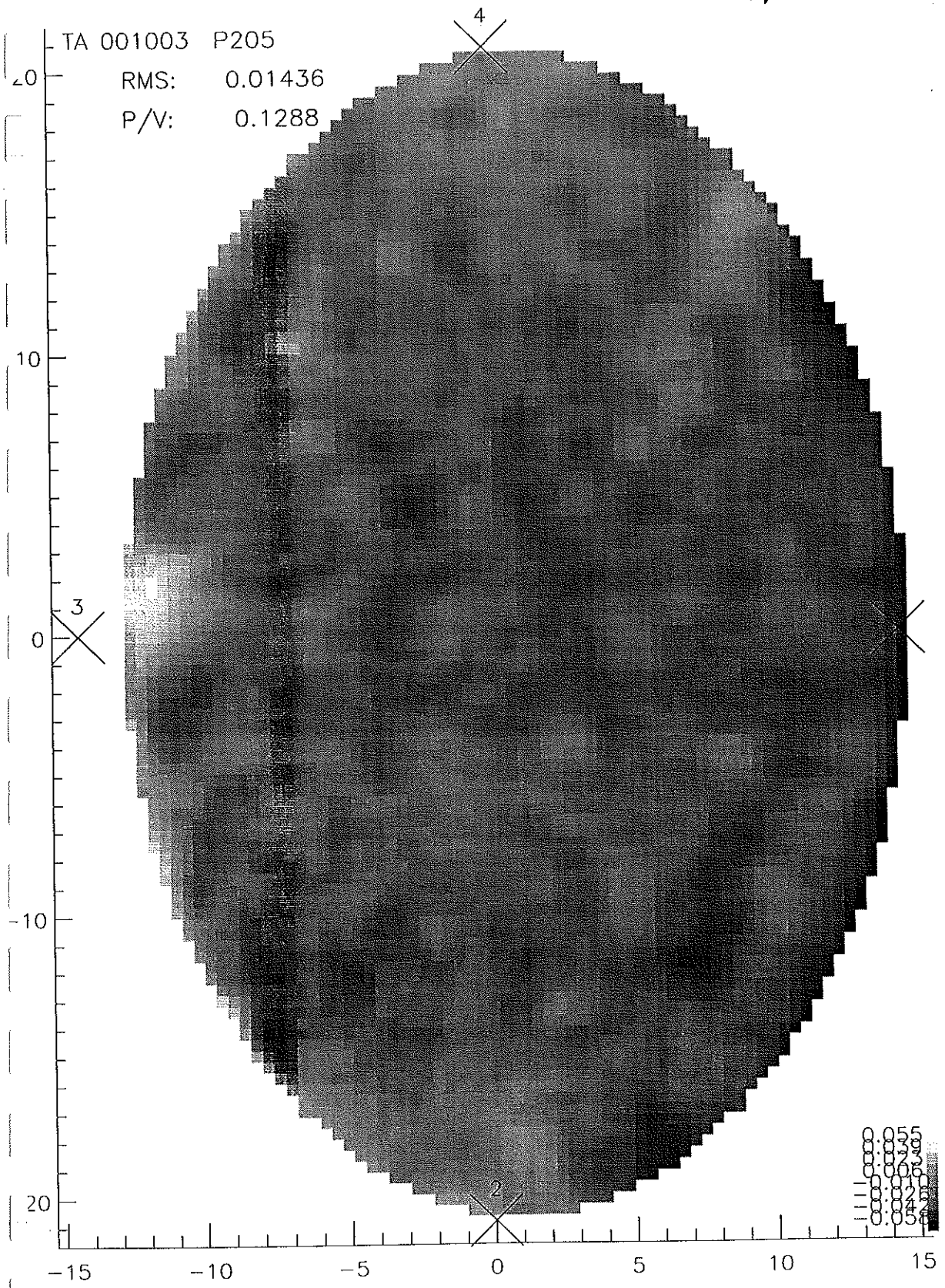
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003103	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	6103	0.031	-0.048	0.007

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.028	0.336	30	67	95	99	0.023	0.011	0.011	0.010	0.010	0.009
001003103	0.029	0.204	30	67	95	99	0.023	0.011	0.011	0.010	0.010	0.009
999999999			42	74	95	98	0.006	0.006	0.006	0.006	0.006	0.006

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003103	-0.141	0.155	66.1	0.018	87.6	-0.013	0.018	43.1	0.041	43.1
999999999	-0.009	0.001	86.9	0.008	93.9	-0.005	0.002	34.9	0.003	-3.9

Δ (Avg. - X Axis 5cm Shear)

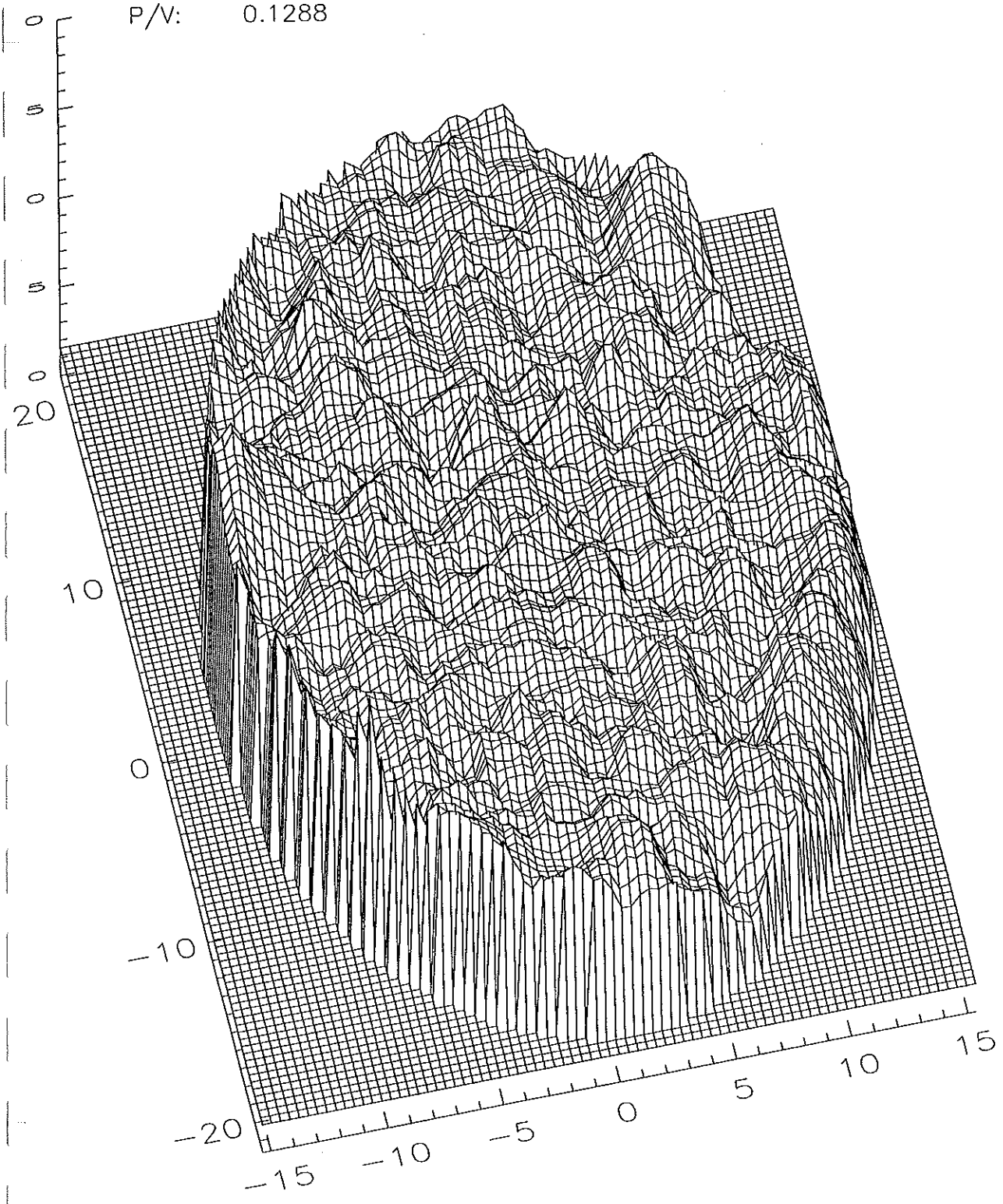
Spec. .04272 Rms



TA 001003 P205 OPD array

RMS: 0.01436

P/V: 0.1288



********** WAVEFRONT COMBINATION PROCESS started at 0001241010 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	105	--	--	-1.0000	none

OPD SUMMARY **********

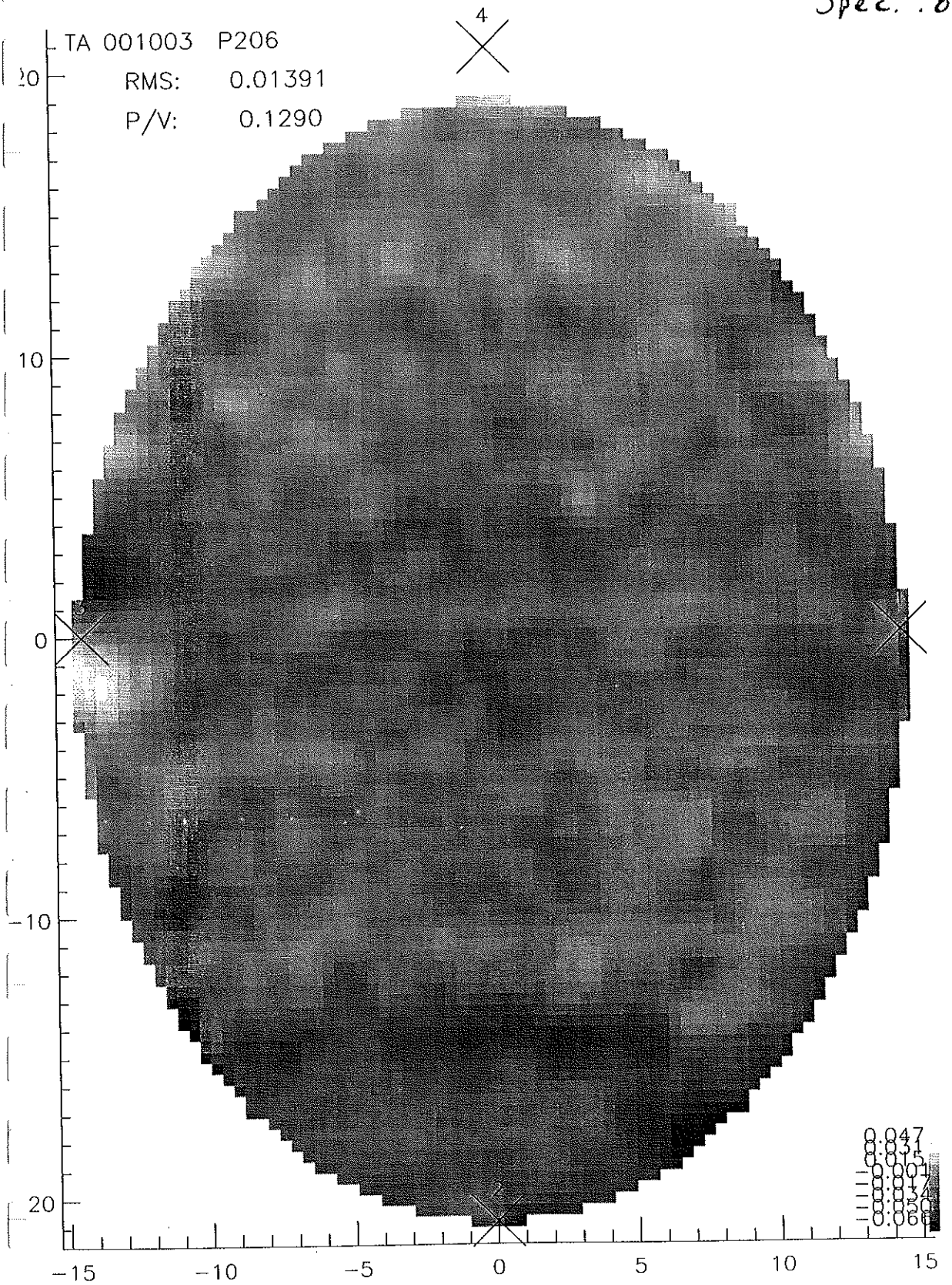
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003105	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6168	6168	0.047	-0.121	0.029
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	5718	0.063	-0.066	0.014

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2 1S 2S 3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.027	0.415	30 67 95 99	0.023	0.011	0.011	0.010	0.010	0.009
001003105	0.028	0.348	31 68 95 99	0.023	0.011	0.010	0.010	0.010	0.009
999999999			43 75 94 98	0.010	0.010	0.009	0.009	0.009	0.009

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003105	-0.133	0.136	66.9	0.025	55.7	-0.011	0.007	21.3	0.034	43.7
999999999	-0.006	0.003	49.5	0.017	177.6	-0.005	0.016	55.8	0.022	-11.6

Δ (Avg. - Y Axis 5Cm Shear)

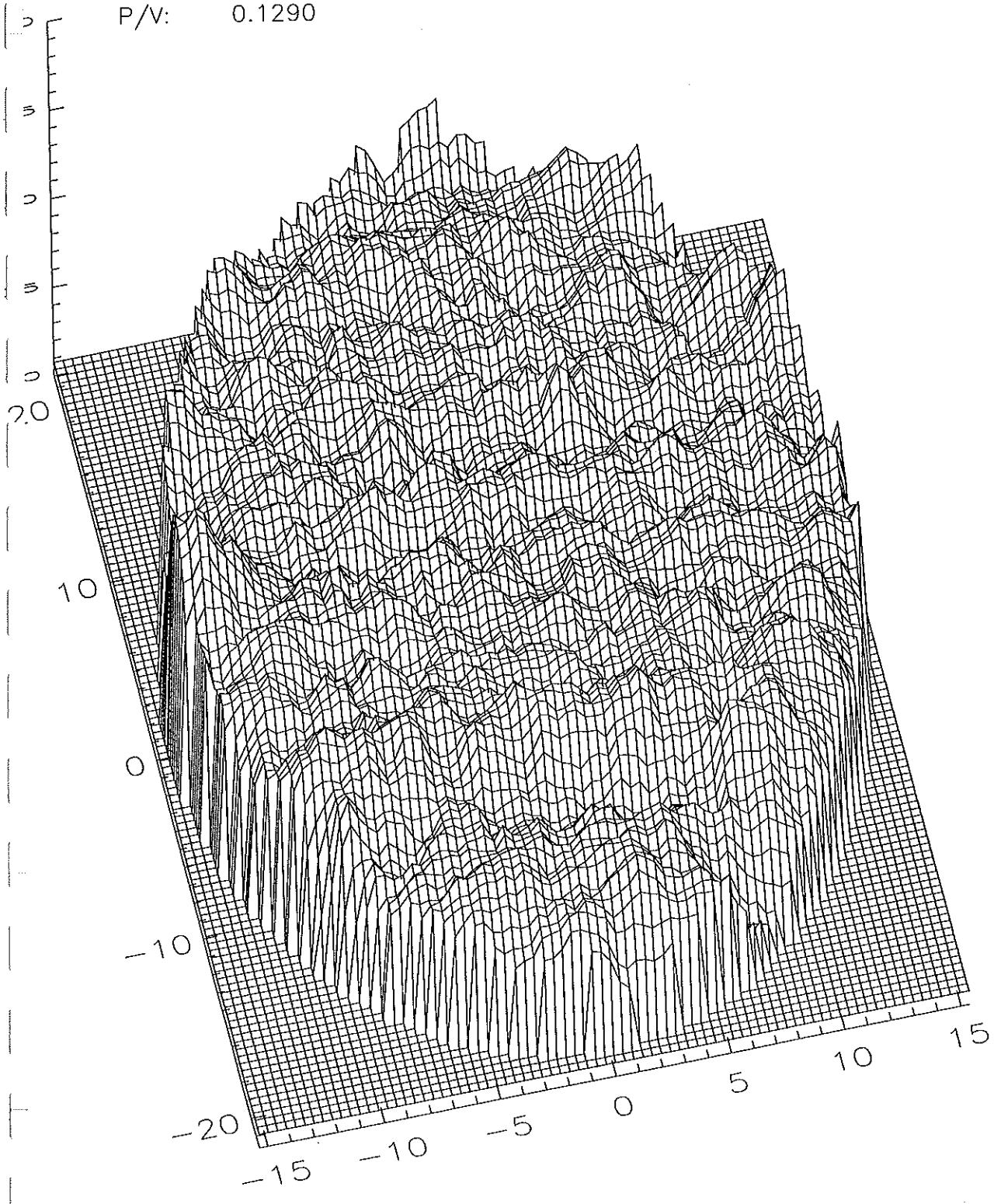
Spec. .0427 2RMS



TA 001003 P206 OPD array

RMS: 0.01391

P/V: 0.1290



********** WAVEFRONT COMBINATION PROCESS started at 0001241010 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	106	--	--	-1.0000	none

OPD SUMMARY **********

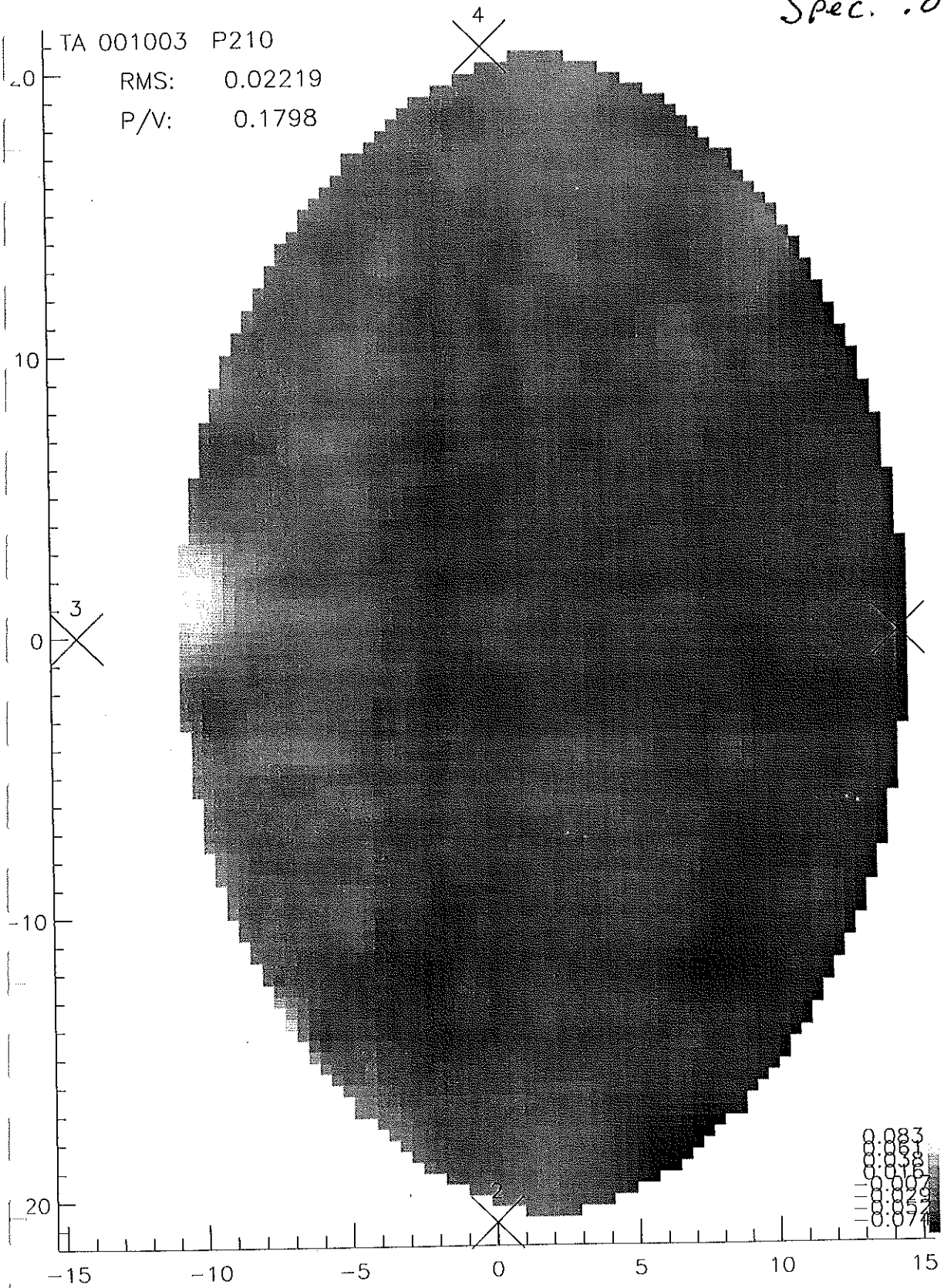
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003106	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6212	6212	0.047	-0.121	0.029
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	5878	0.055	-0.074	0.014

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.027	0.431	30	67	95	99	0.023	0.011	0.011	0.010	0.010	0.009
001003106	0.028	0.287	30	67	96	99	0.023	0.011	0.010	0.010	0.010	0.009
999999999			44	74	95	98	0.010	0.010	0.010	0.010	0.010	0.010

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003106	-0.141	0.163	65.6	0.013	80.1	-0.011	0.026	37.4	0.049	42.7
999999999	-0.023	0.004	87.4	0.009	107.1	-0.013	0.004	-43.0	0.003	-17.8

Δ (Avg. - X Axis 10 cm Shear)

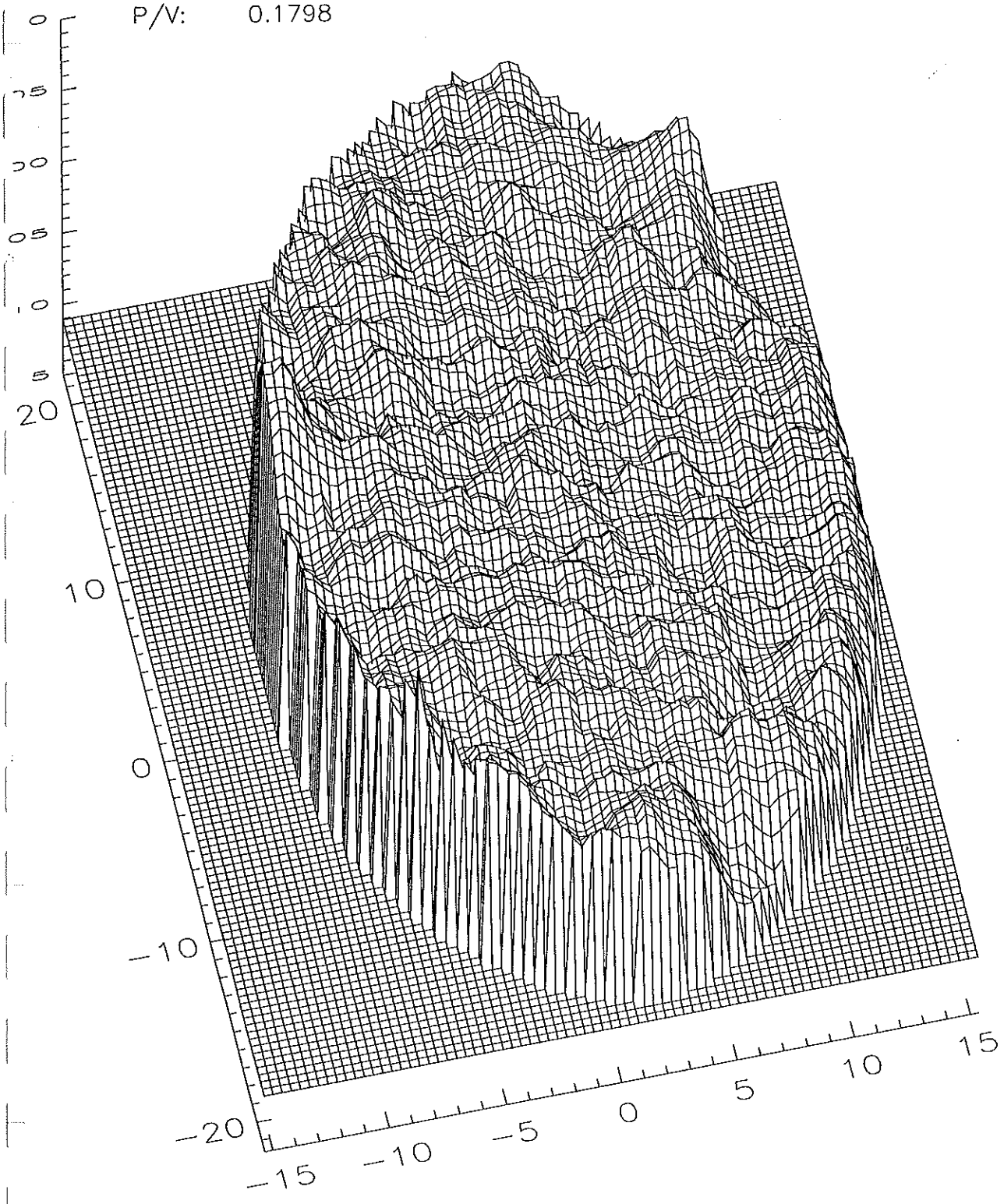
Spec. .0648 λRMS



TA 001003 P210 OPD array

RMS: 0.02219

P/V: 0.1798



********** WAVEFRONT COMBINATION PROCESS started at 0001241011 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	110	--	--	-1.0000	none

OPD SUMMARY **********

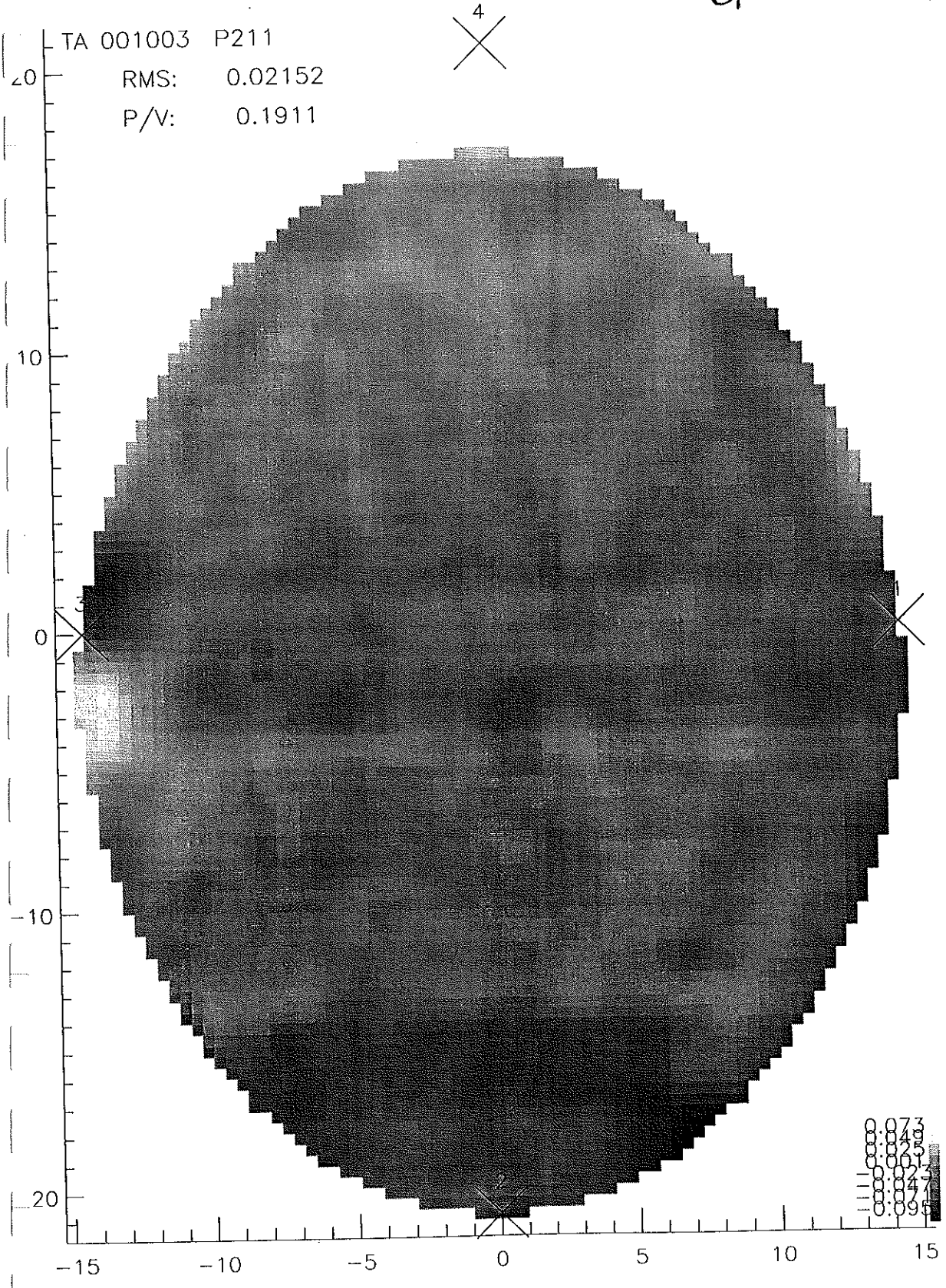
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003110	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	5895	5895	0.047	-0.121	0.029
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	5193	0.095	-0.085	0.022

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.026	0.505	30	67	95	99	0.023	0.011	0.011	0.010	0.010	0.009
001003110	0.027	0.462	31	69	95	99	0.024	0.012	0.011	0.010	0.010	0.009
999999999			38	70	96	99	0.011	0.011	0.011	0.011	0.011	0.010

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003110	-0.145	0.148	70.0	0.033	41.8	-0.011	0.022	4.7	0.047	43.6
999999999	-0.012	0.003	-30.8	0.008	30.3	-0.008	0.029	43.6	0.042	-12.4

Δ (Avg. - Y Axis 10 cm Shear)

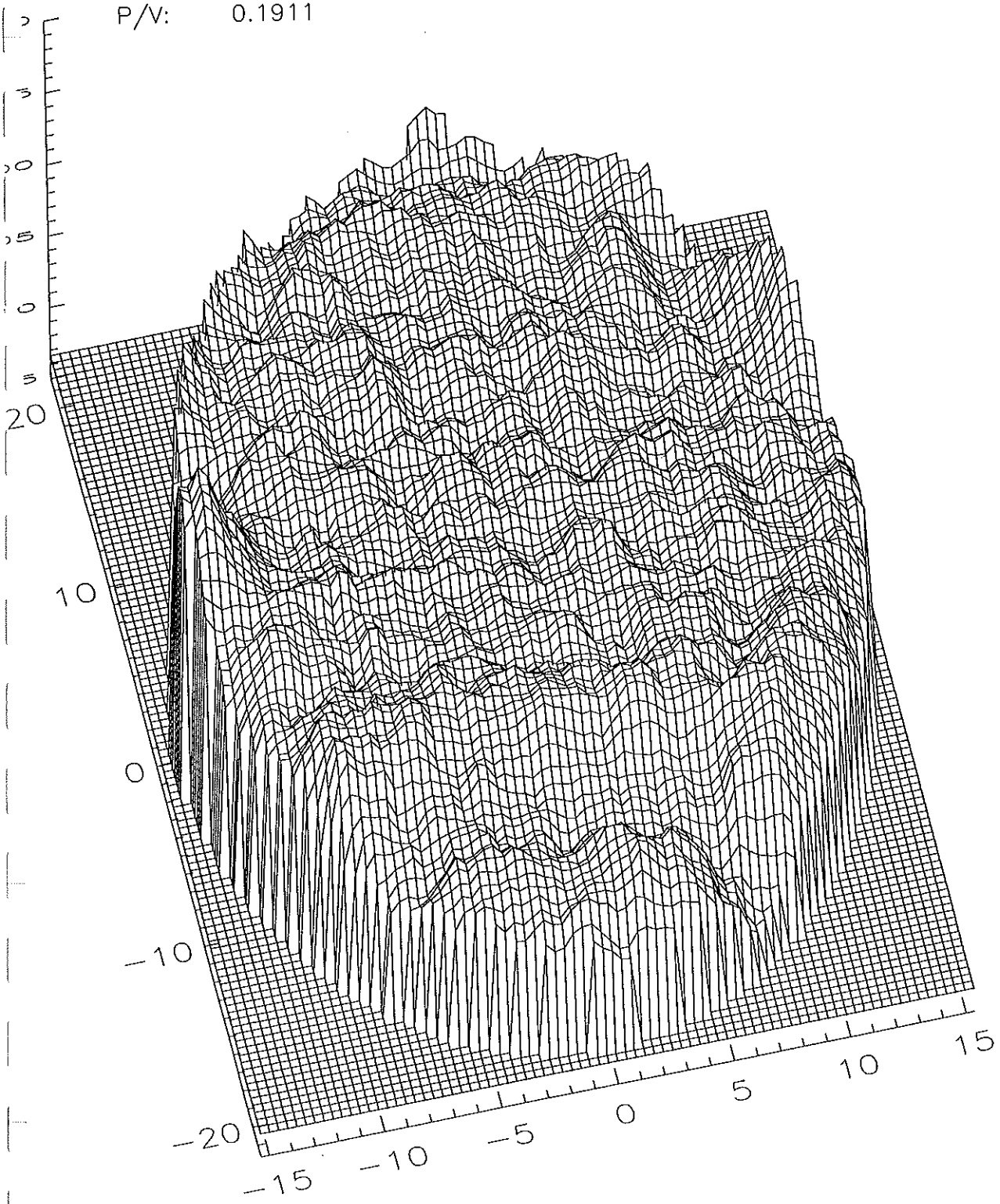
Spec. .064/8 2RMS



TA 001003 P211 OPD array

RMS: 0.02152

P/V: 0.1911



********** WAVEFRONT COMBINATION PROCESS started at 0001241012 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	111	--	--	-1.0000	none

OPD SUMMARY **********

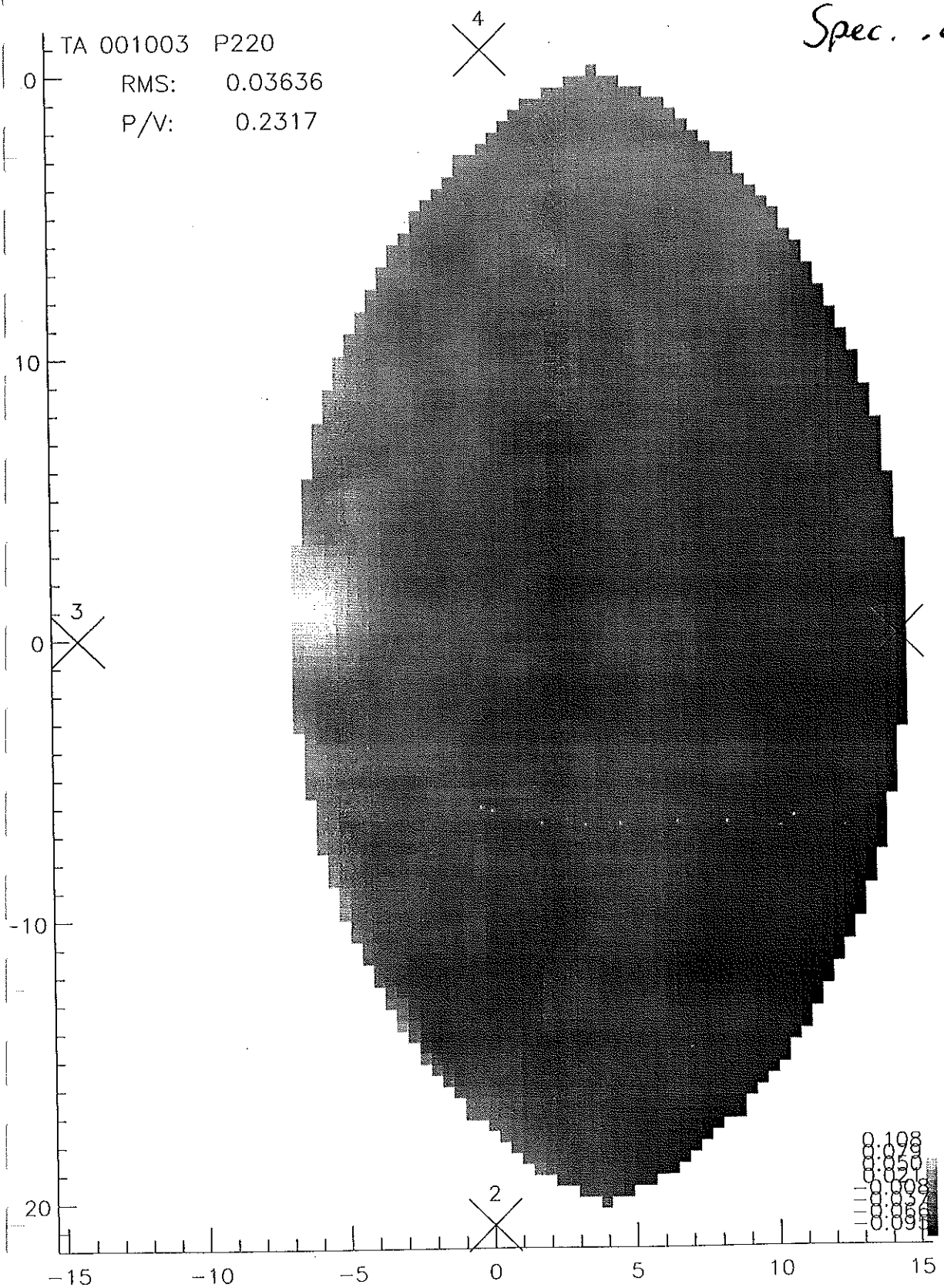
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003111	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6053	6053	0.047	-0.118	0.028
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	5503	0.085	-0.107	0.022

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2 1S 2S 3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.026	0.517	30 67 95 99	0.023	0.011	0.011	0.010	0.010	0.009
001003111	0.028	0.398	31 68 95 99	0.025	0.010	0.010	0.010	0.010	0.009
999999999			45 72 94 98	0.014	0.014	0.014	0.013	0.012	0.012

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003111	-0.157	0.171	64.2	0.002	-15.1	-0.013	0.046	33.9	0.053	42.4
999999999	-0.044	0.015	86.7	0.003	179.0	-0.023	0.016	-33.9	0.012	36.7

Δ (Avg. − X Axis 20cm Shear)

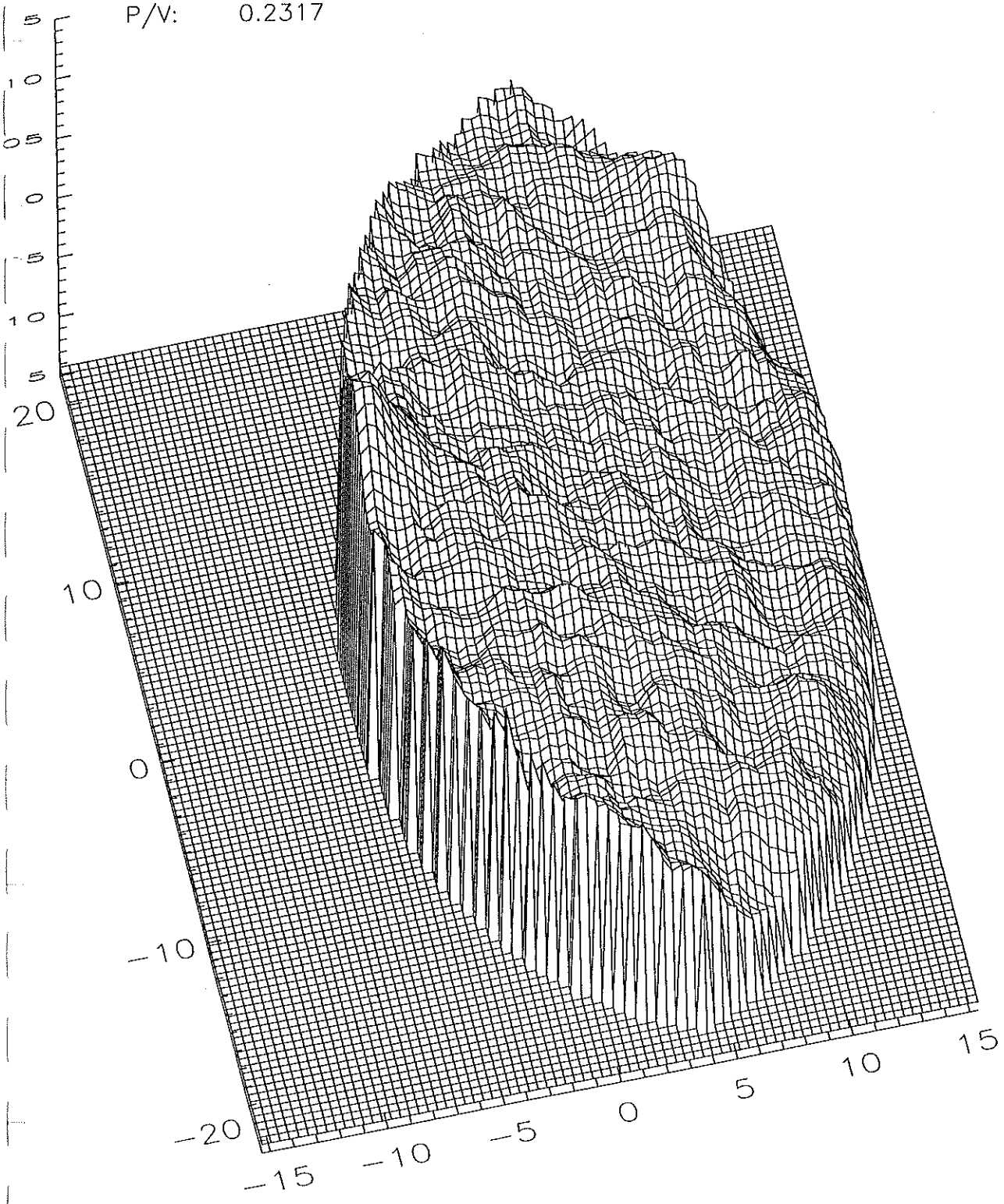
Spec. .0901 λRMS



TA 001003 P220 OPD array

RMS: 0.03636

P/V: 0.2317



********** WAVEFRONT COMBINATION PROCESS started at 0001241012 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	120	--	--	-1.0000	none

OPD SUMMARY **********

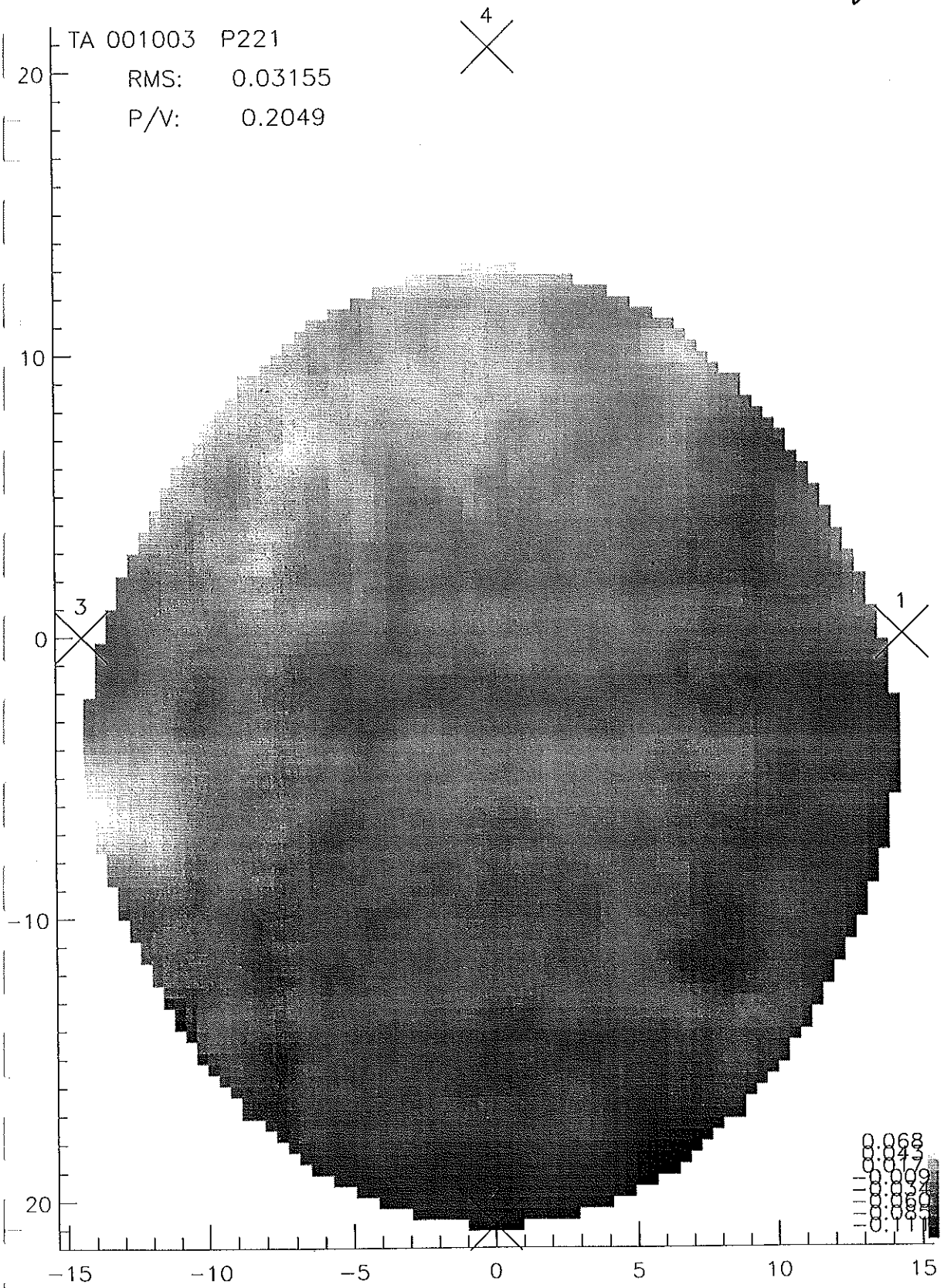
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003120	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	5101	5101	0.047	-0.121	0.029
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	4153	0.122	-0.110	0.036

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2	1S	2S	3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.027	0.672	30	67	95	99	0.023	0.011	0.011	0.010	0.010	0.009
001003120	0.027	0.669	31	70	95	99	0.026	0.012	0.010	0.010	0.010	0.009
999999999			35	65	96	99	0.015	0.017	0.016	0.015	0.012	0.010

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003120	-0.198	0.178	73.8	0.045	39.2	-0.017	0.038	2.0	0.055	45.0
999999999	-0.017	0.057	-23.7	0.021	66.4	-0.016	0.117	44.8	0.069	-10.7

Δ (Avg. - Y Axis 20 cm Shear)

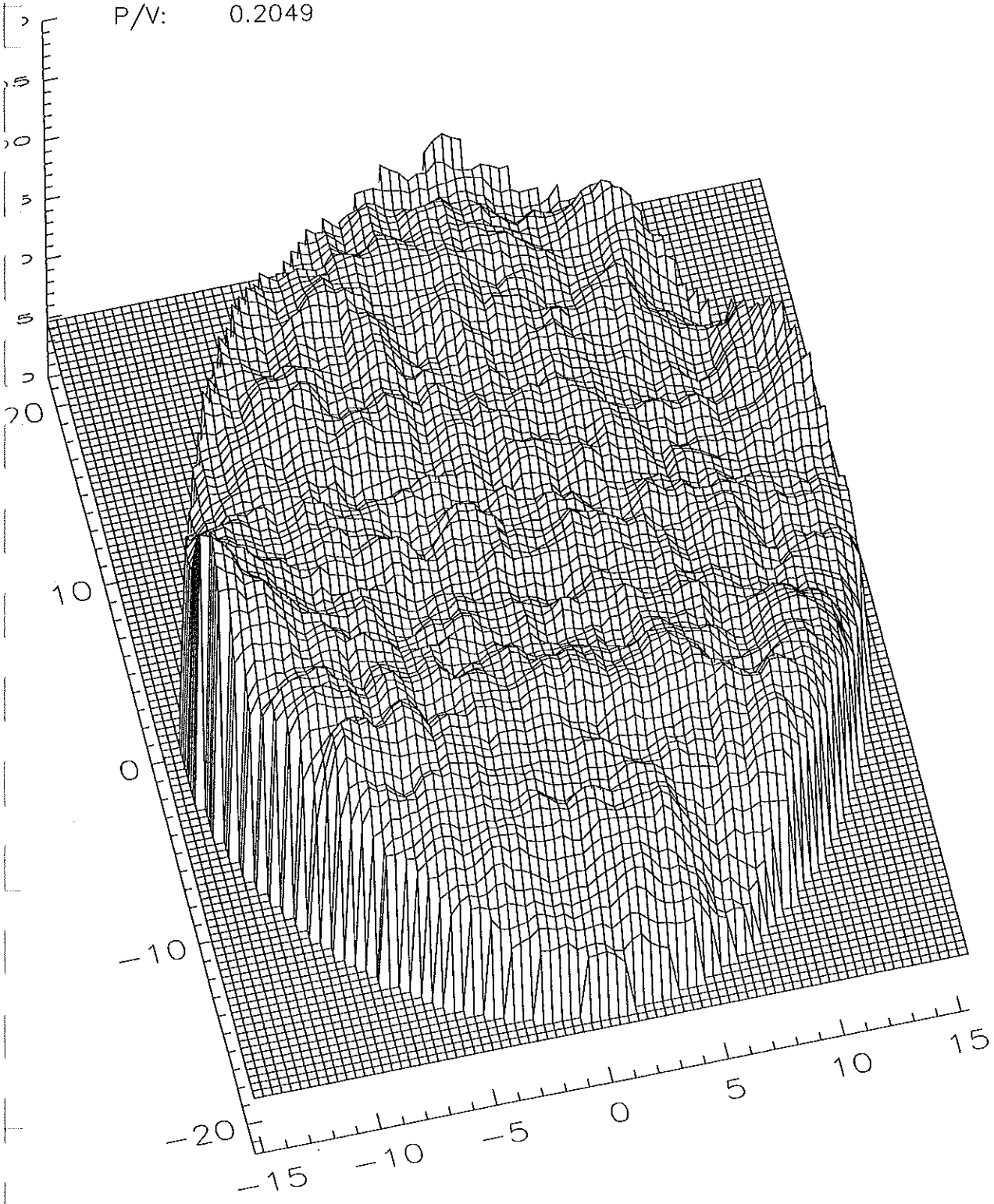
Spec. .0901



TA 001003 P221 OPD array

RMS: 0.03155

P/V: 0.2049



********** WAVEFRONT COMBINATION PROCESS started at 0001241013 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	121	--	--	-1.0000	none

OPD SUMMARY **********

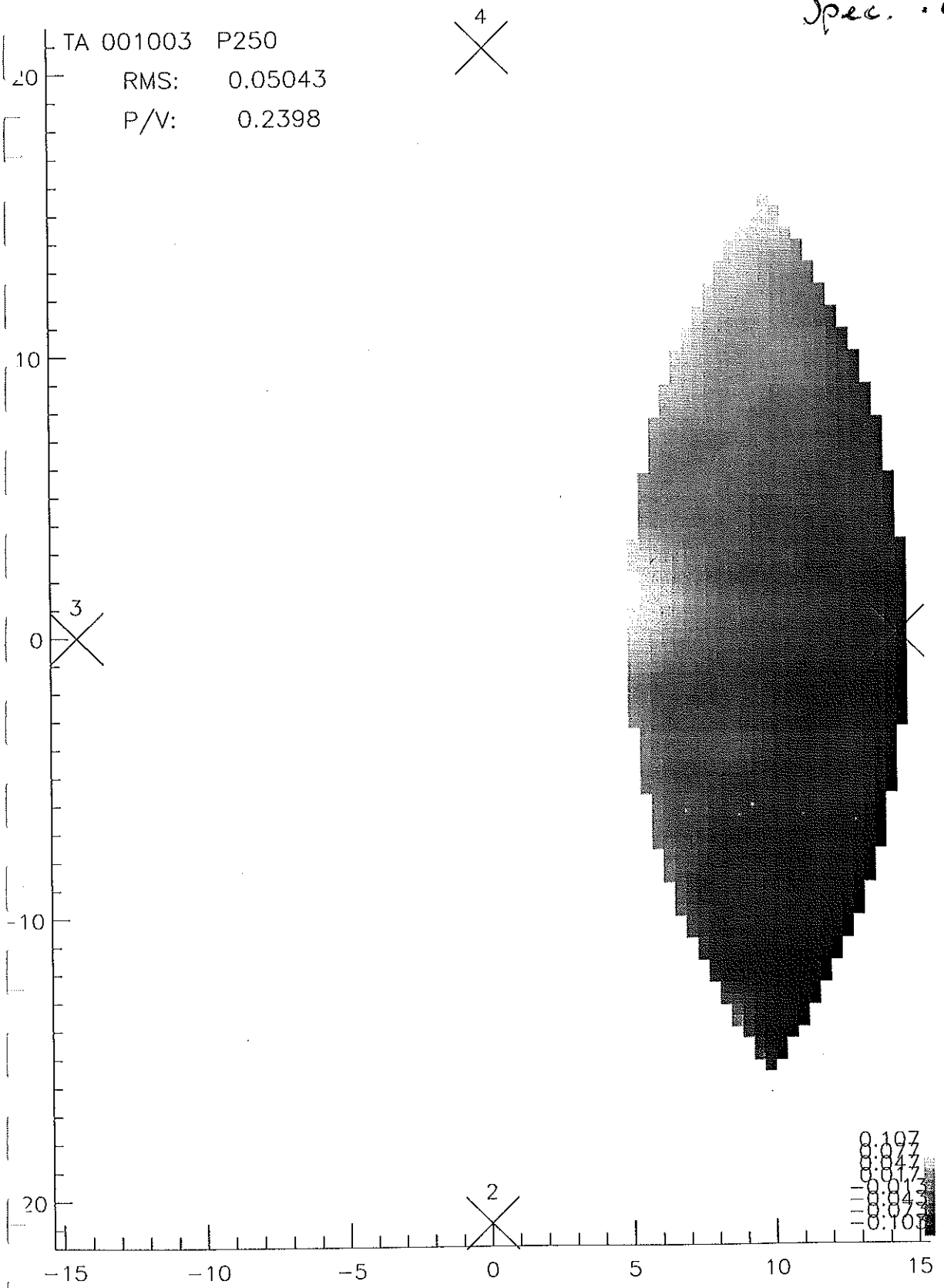
TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003121	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	5575	5575	0.047	-0.099	0.028
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	4759	0.081	-0.124	0.032

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2 1S 2S 3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.026	0.638	30 67 95 99	0.023	0.011	0.011	0.010	0.010	0.009
001003121	0.027	0.575	31 68 95 99	0.026	0.011	0.011	0.010	0.009	0.008
999999999			42 69 95 98	0.020	0.020	0.020	0.013	0.011	0.011

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003121	-0.116	0.171	58.2	0.020	79.9	0.010	0.080	29.0	0.032	34.9
999999999	-0.105	0.041	-79.6	0.055	-102.0	-0.047	0.044	-25.9	0.041	36.7

Δ (Avg. – X Axis 50cm Shear)

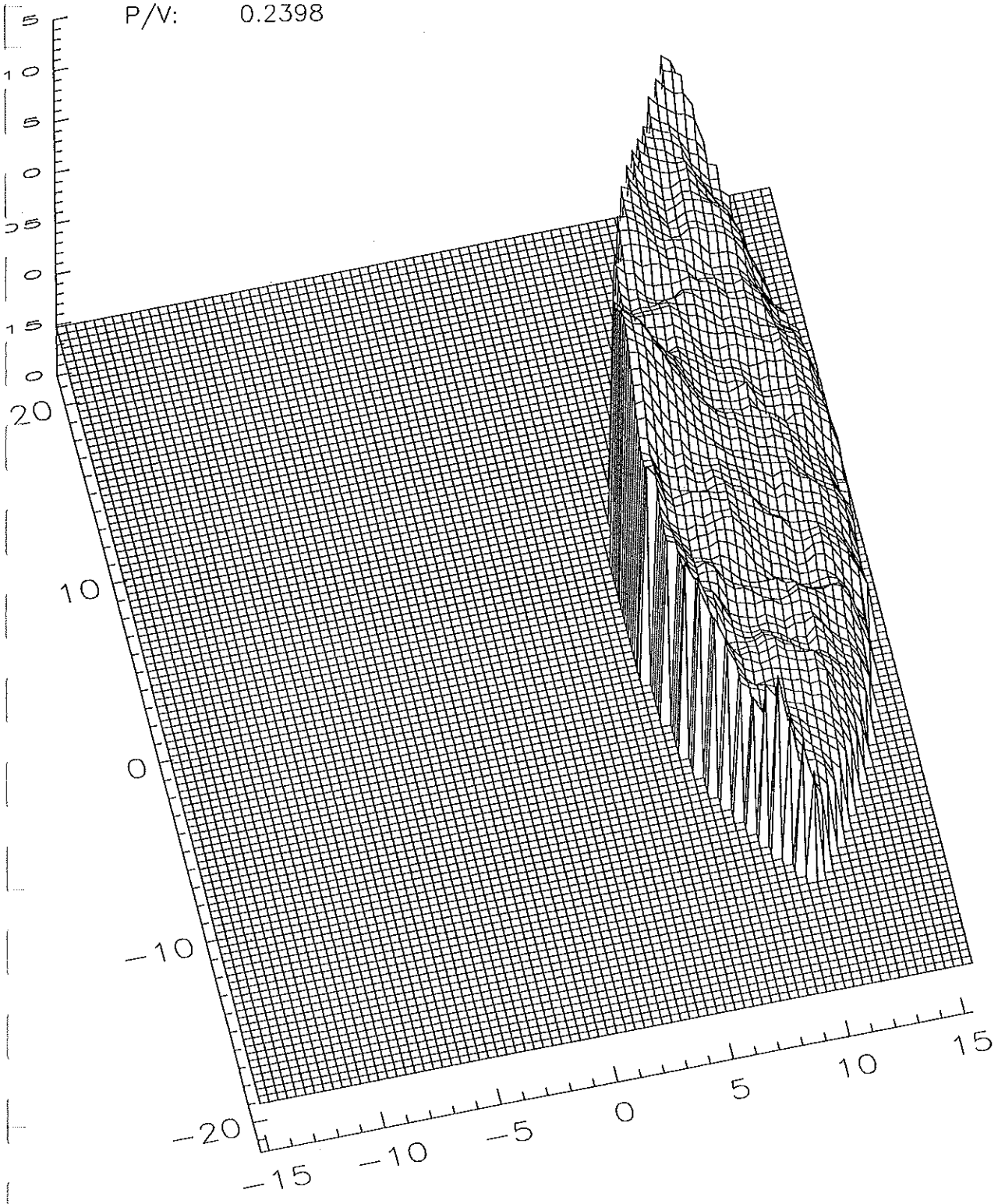
Spec. .090 > RMS



TA 001003 P250 OPD array

RMS: 0.05043

P/V: 0.2398



********** WAVEFRONT COMBINATION PROCESS started at 0001241013 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	150	--	--	-1.0000	none

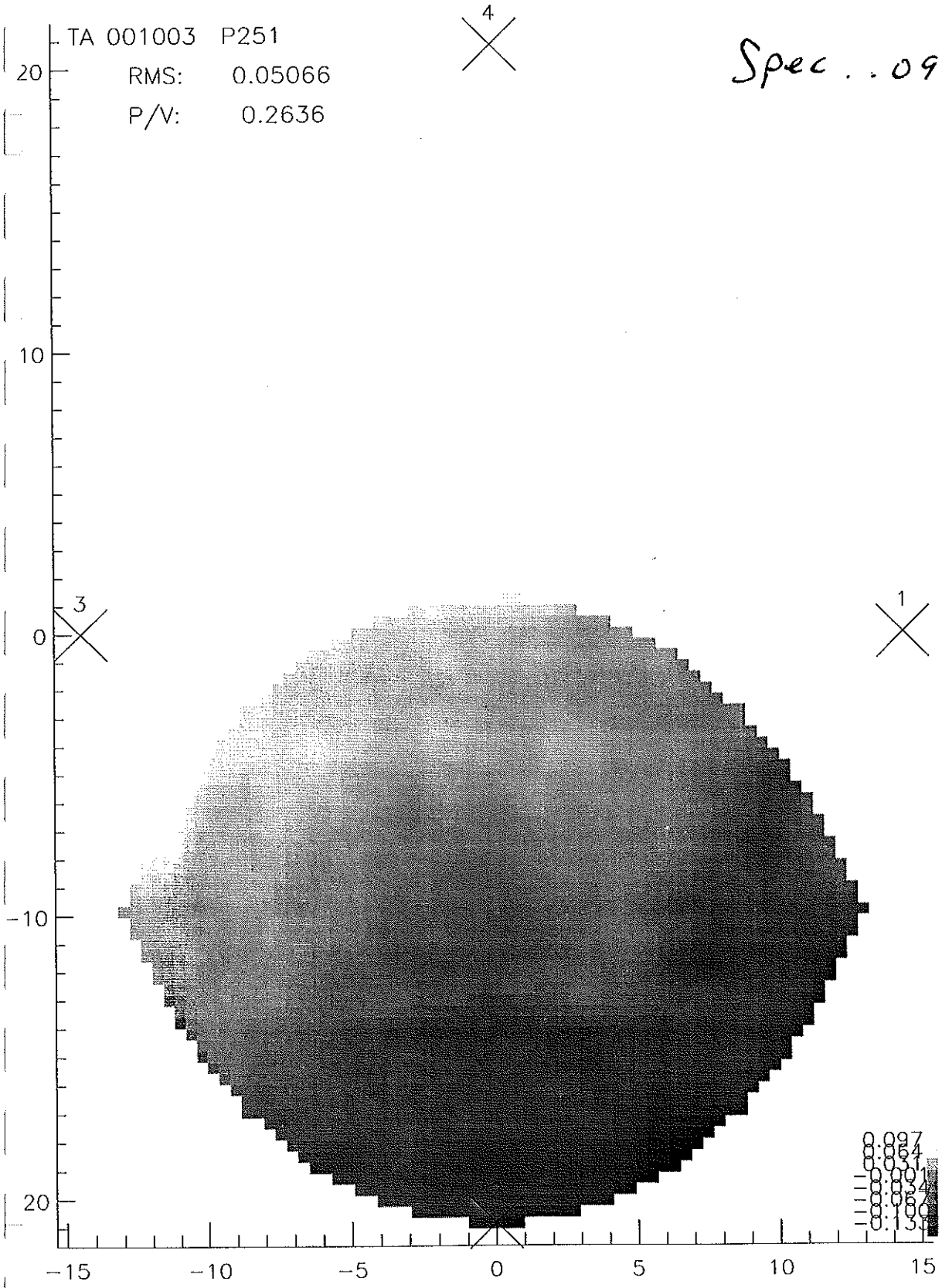
OPD SUMMARY **********

TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003150	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	2025	2025	0.042	-0.094	0.029
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	1371	0.122	-0.118	0.050

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2 1S 2S 3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.027	0.894	30 67 95 99	0.023	0.011	0.011	0.010	0.010	0.009
001003150	0.026	0.919	29 64 96 99	0.074	0.112	0.071	0.070	0.052	0.010
999999999			32 66 96100	0.116	0.201	0.159	0.165	0.091	0.012

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003150	0.304	0.695	86.1	0.368	172.2	0.050	1.044	-1.2	0.552	43.2
999999999	-0.611	1.228	0.5	0.463	-2.2	-0.093	1.709	59.7	0.750	-0.5

Δ (Avg. -Y Axis 50 cm Shear)

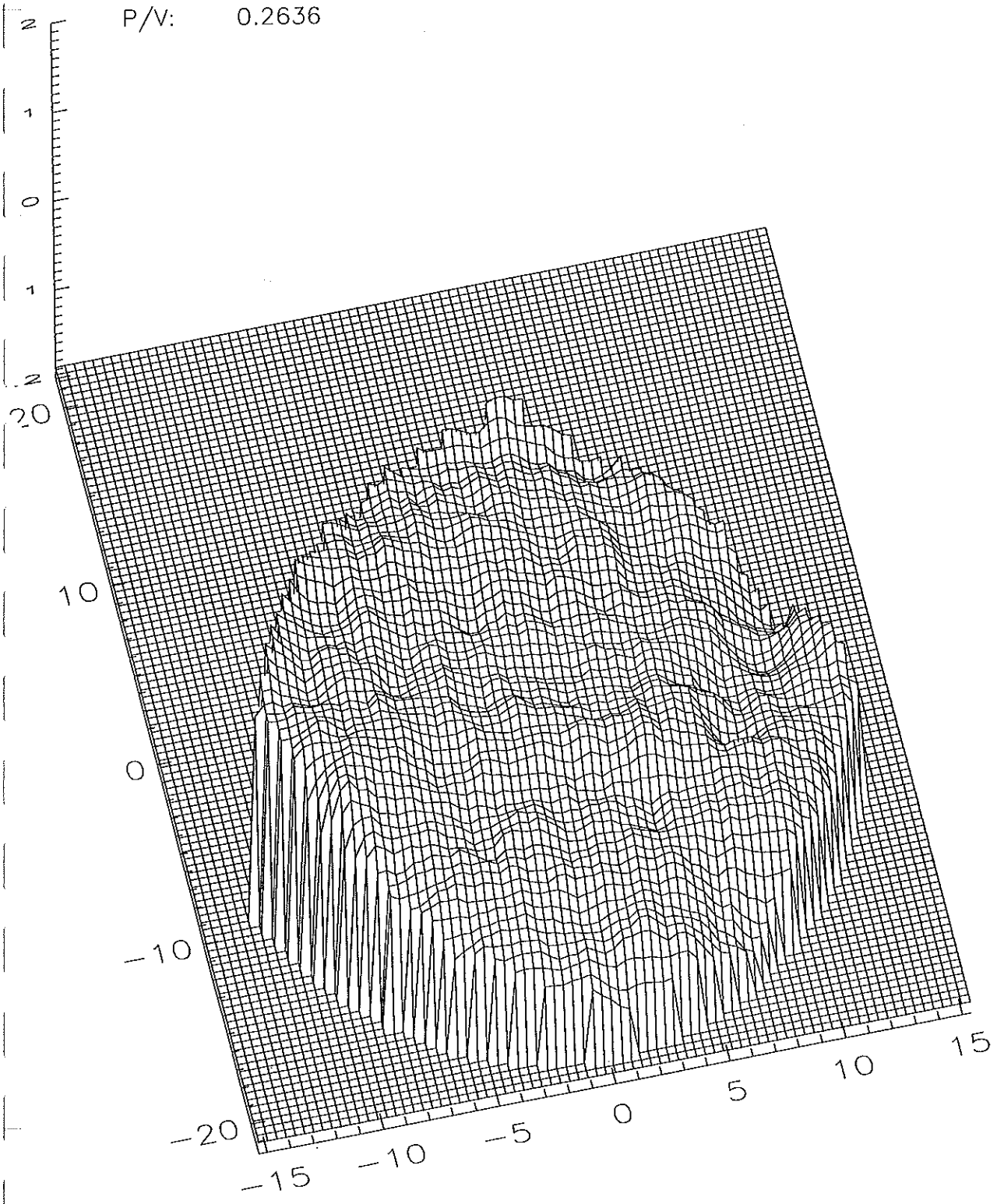


Spec . . 0901 λ Rms

TA 001003 P251 OPD array

RMS: 0.05066

P/V: 0.2636



********** WAVEFRONT COMBINATION PROCESS started at 0001241014 **********

WAVEFRONT COMBINATION PARAMETERS ----------
combination type: add area: common aggregate focus: none

TA	Pic	Flip	Rot	Mult	Focus
001003	024	--	--	1.0000	none
001003	151	--	--	-1.0000	none

OPD SUMMARY **********

TA/PIC	Title	X	Y	XST	YST	XINC	YINC	Exist pts	Valid pts	Peak	Valley	RMS
001003024	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	6253	6253	0.047	-0.121	0.030
001003151	Magellan Tertiary Mi	079	111	-15.354	-21.653	0.39370	0.39370	3539	3539	0.047	-0.094	0.028
999999999	AGGREGATE	079	111	-15.354	-21.653	0.39370	0.39370	6253	2643	0.114	-0.150	0.051

TA/PIC	Diff. RMS	Corr. ind.	--Barchart-- S/2 1S 2S 3S	Power rms	Astig rms	Coma rms	Spher rms	Tref rms	Tetra rms
001003024	0.028	0.879	30 67 95 99	0.023	0.011	0.011	0.010	0.010	0.009
001003151	0.031	0.844	31 65 96 99	0.041	0.030	0.030	0.029	0.018	0.008
999999999			29 64 97100	0.035	0.052	0.049	0.048	0.024	0.010

TA/PIC	Power mag	Astig mag	Astig ang	Coma mag	Coma ang	Spher mag	Trefoil mag	Trefoil ang	Tetra mag	Tetra ang
001003024	-0.130	0.142	66.1	0.020	88.1	-0.011	0.013	48.8	0.035	43.1
001003151	-0.158	0.392	41.2	0.009	58.8	-0.014	0.340	47.8	0.162	-29.3
999999999	-0.008	0.516	86.0	0.040	118.8	-0.018	0.517	-38.1	0.194	-8.7