



Test report on flatness of 'B' ears for Advanced LIGO NP-type monolithic suspension

Rev 00, submitted by L Cunningham 09 August 2007

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1.0 Summary

Measurements were made of all 20 delivered 'B' style ears¹. These were found to be satisfactory in the main with most easily bettering the $\lambda/10$ flatness requirements. Exceptions were B09 which had measured flatness of 0.132λ and B16 which was measured as 0.104λ . All measurements were filtered to remove the outermost 5 pixels.

B12 was found to be machined incorrectly. The flat is on the wrong side in relation to the shape of the holder which is dimensioned to fit the asymmetric ear shape. This suggests it may be a mislabeled 'A' style ear. Full details along with the interferograms are included for each ear.

In conclusion 17 of 20 ears met or bettered the $\lambda/10$ (0.1λ) specification. All measurements were carried out using the tooling clamp to hold the samples. The fixing screw on the handling jig^{2,3} was not used for any of the measurements.

Table 1 Flatness measurements for 'B' ears with Pass/ Fail based on $\lambda/10$ specification.

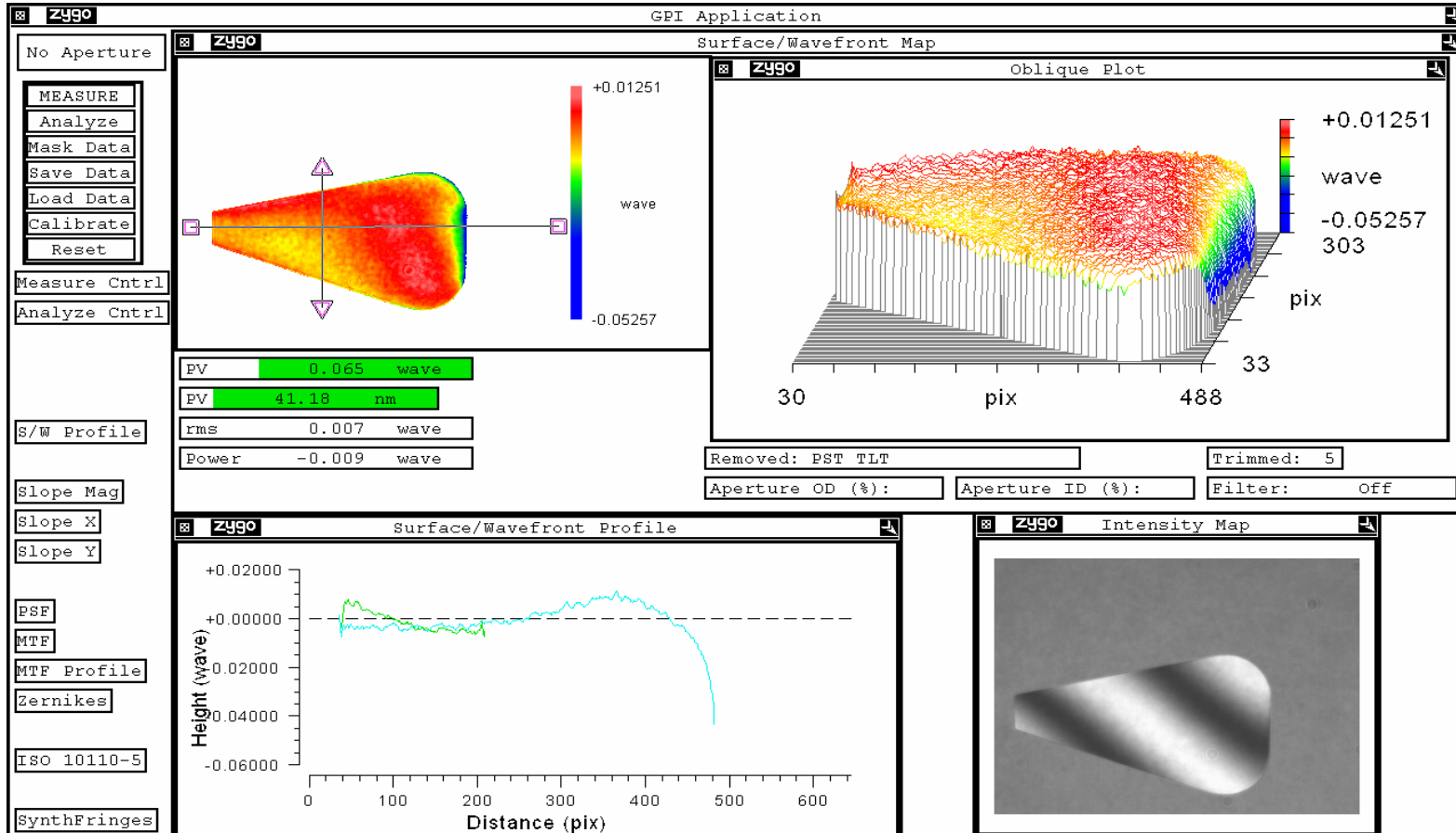
Sample name	Measured flatness (λ)	Pass/ Fail
B1	0.065 ¹	Pass
B2	0.099	Pass
B3	0.065	Pass
B4	0.075	Pass
B5	0.071	Pass
B6	0.052	Pass
B7	0.052	Pass
B8	0.071	Pass
B9	0.132	Fail
B10	0.062	Pass
B11	0.065	Pass
B12 (incorrectly machined)	0.081	Pass (wrong surface)
B13	0.090	Pass
B14	0.063	Pass
B15	0.065	Pass
B16	0.104	Fail
B17	0.051	Pass
B18	0.092	Pass
B19	0.050	Pass
B20	0.060	Pass

¹D060056-02-K NP-type Refined Ear (Type B)

²T070070-00-K Noise Prototype Ear Bonding Jig Review of Draft Design

³T070156-01-K Advanced Testing of Noise Prototype Ear Bonding Jig

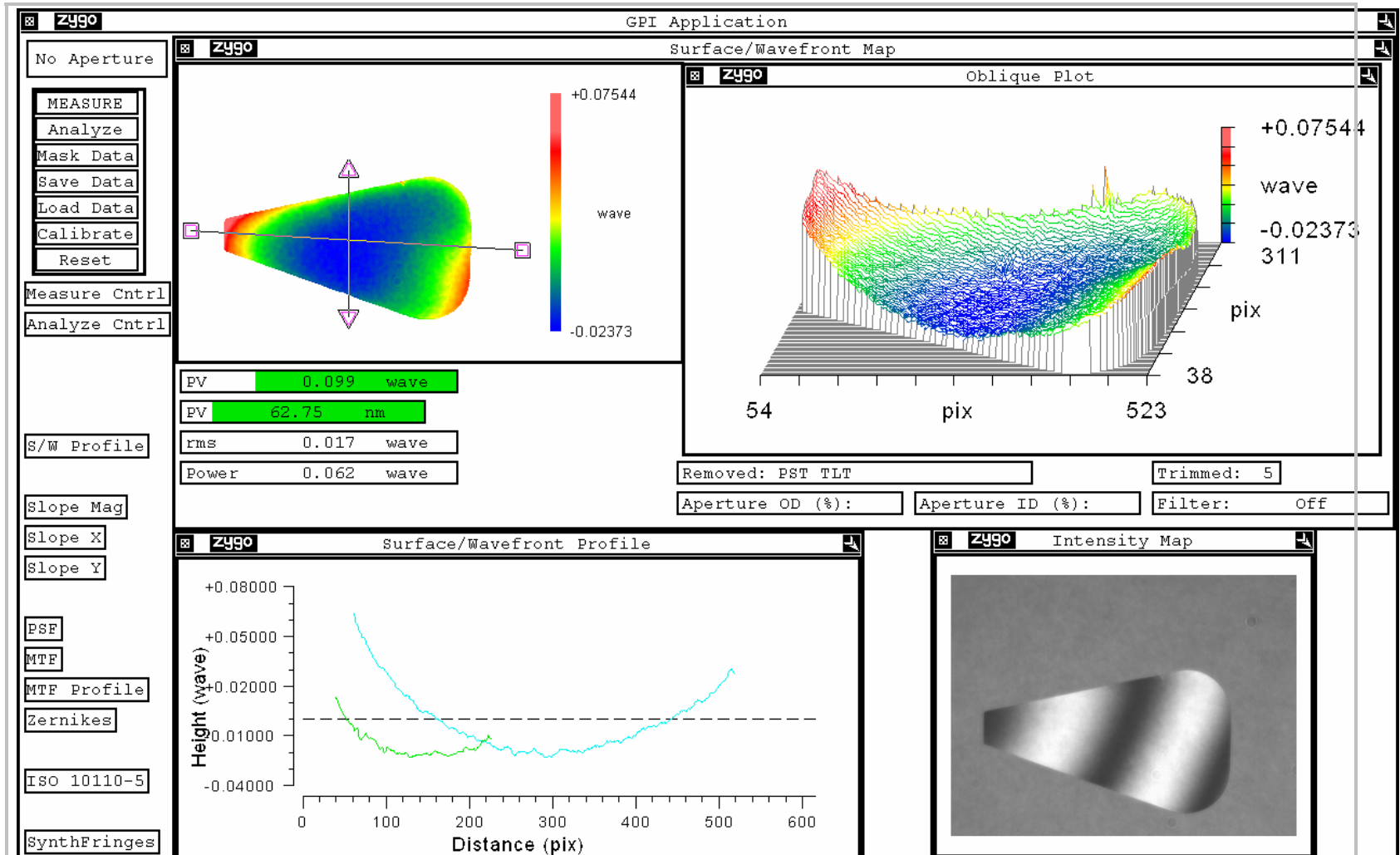
2.0 Interferograms of ears B01- B20



B 1 flatness 0.065 λ



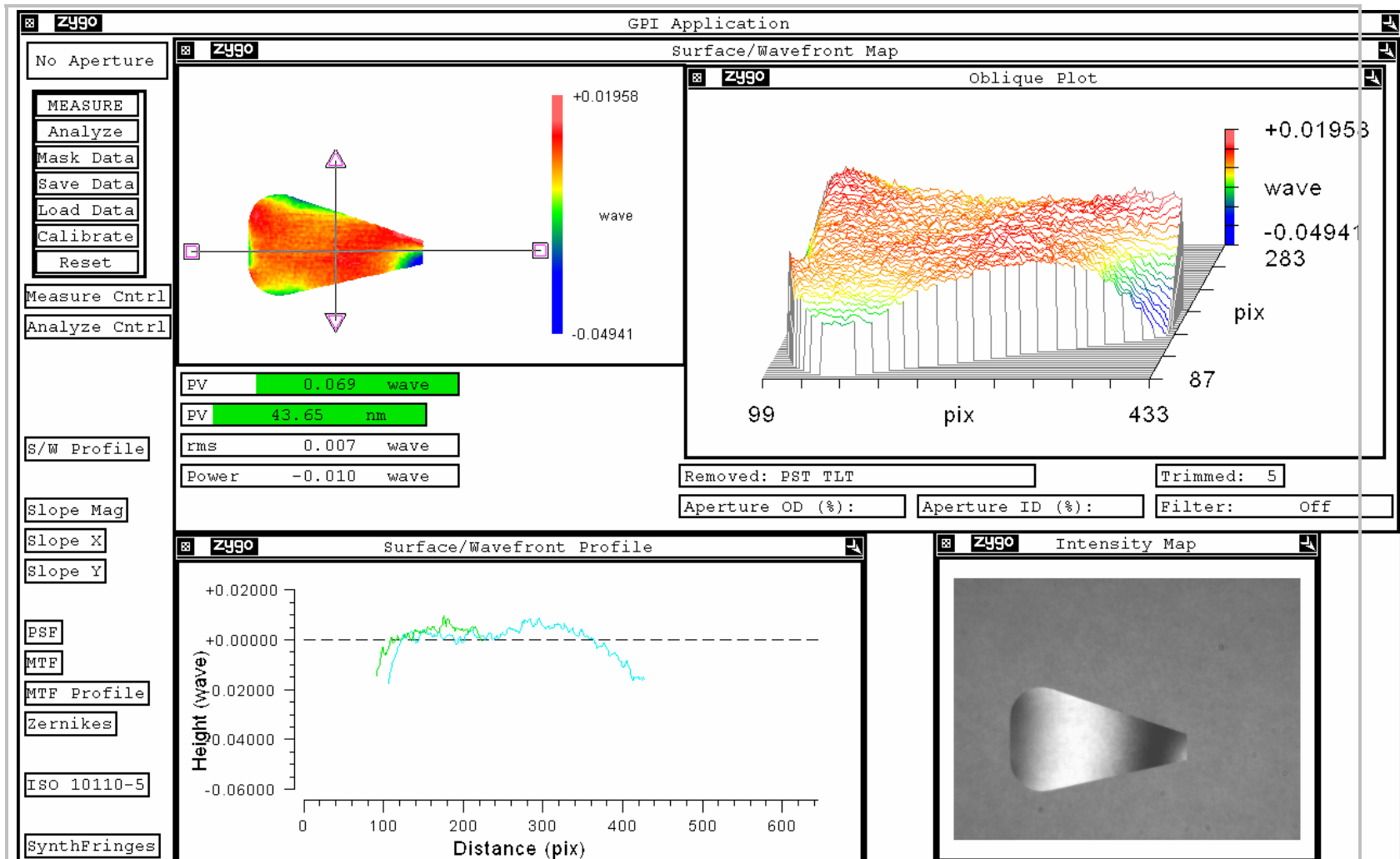
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B2 flatness 0.099 λ



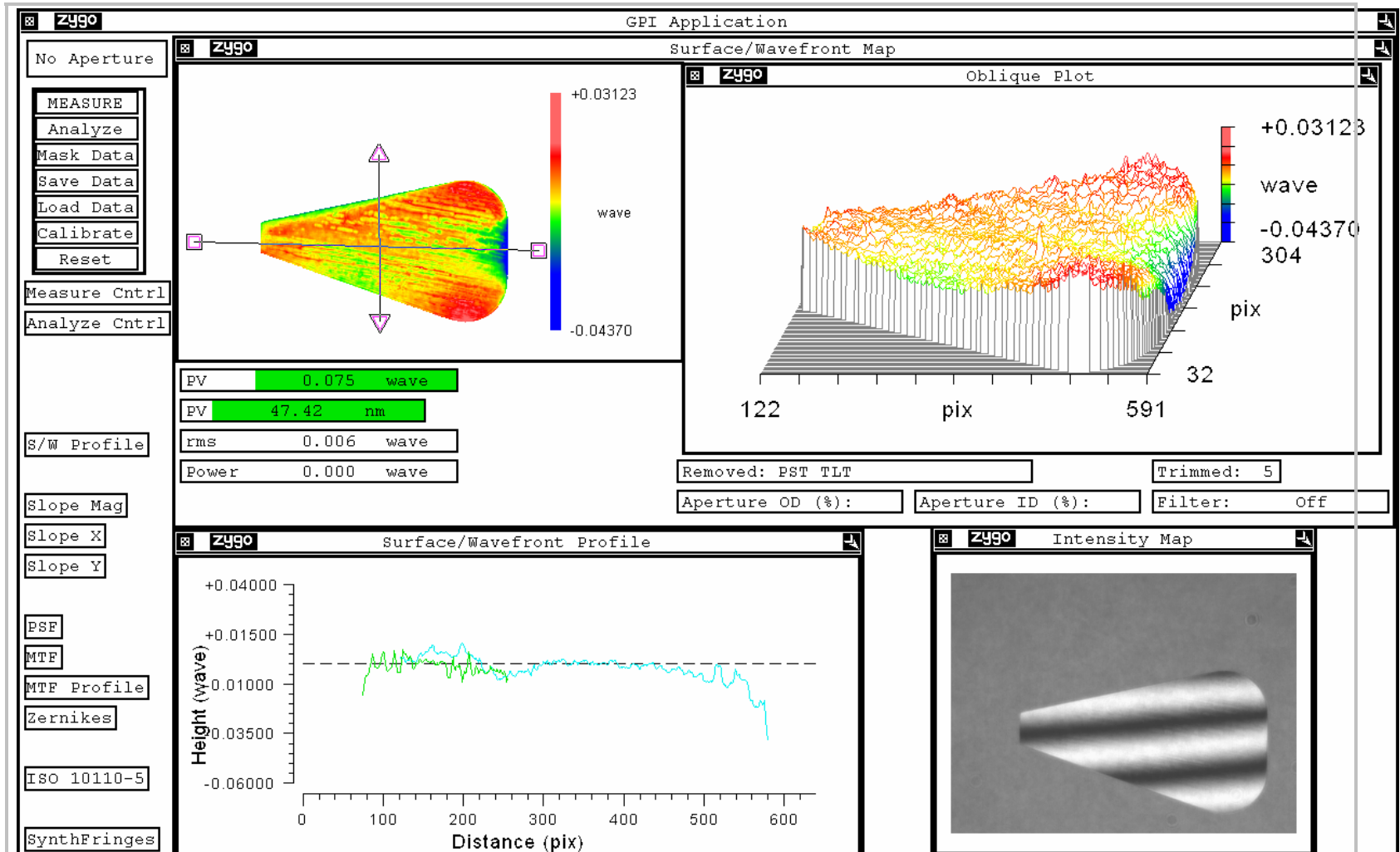
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B3 flatness 0.069 λ



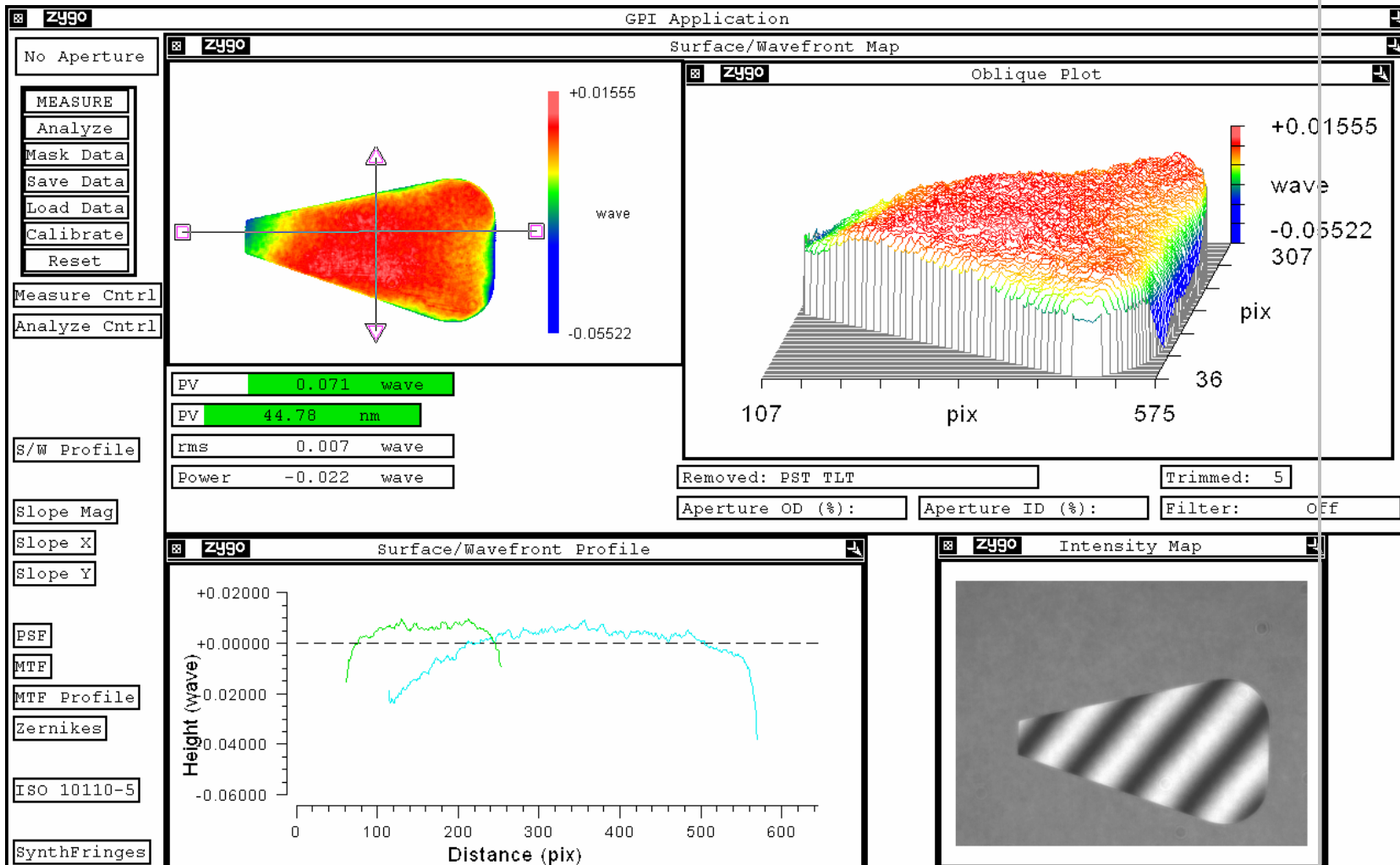
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B 2 flatness 0.075 λ

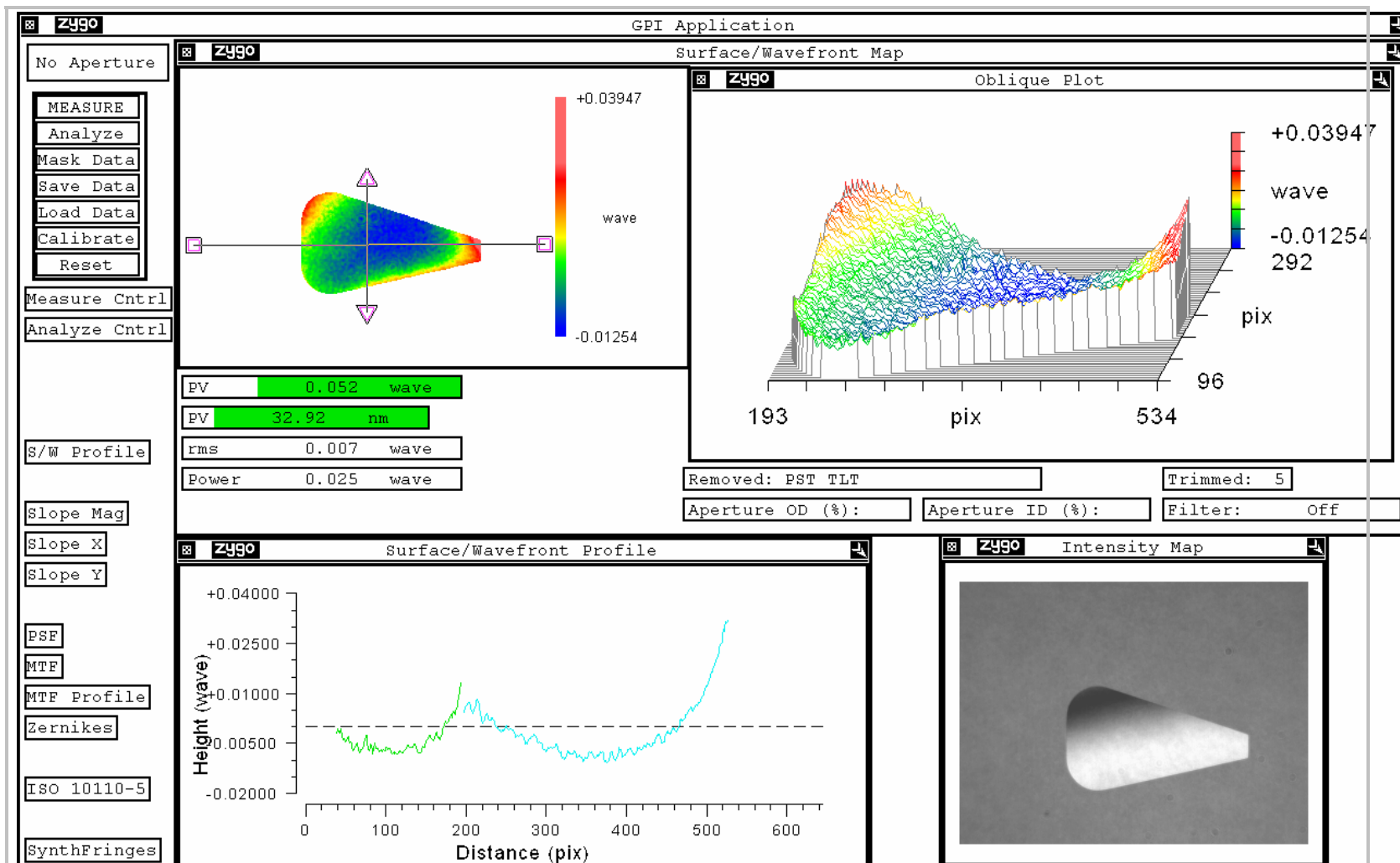


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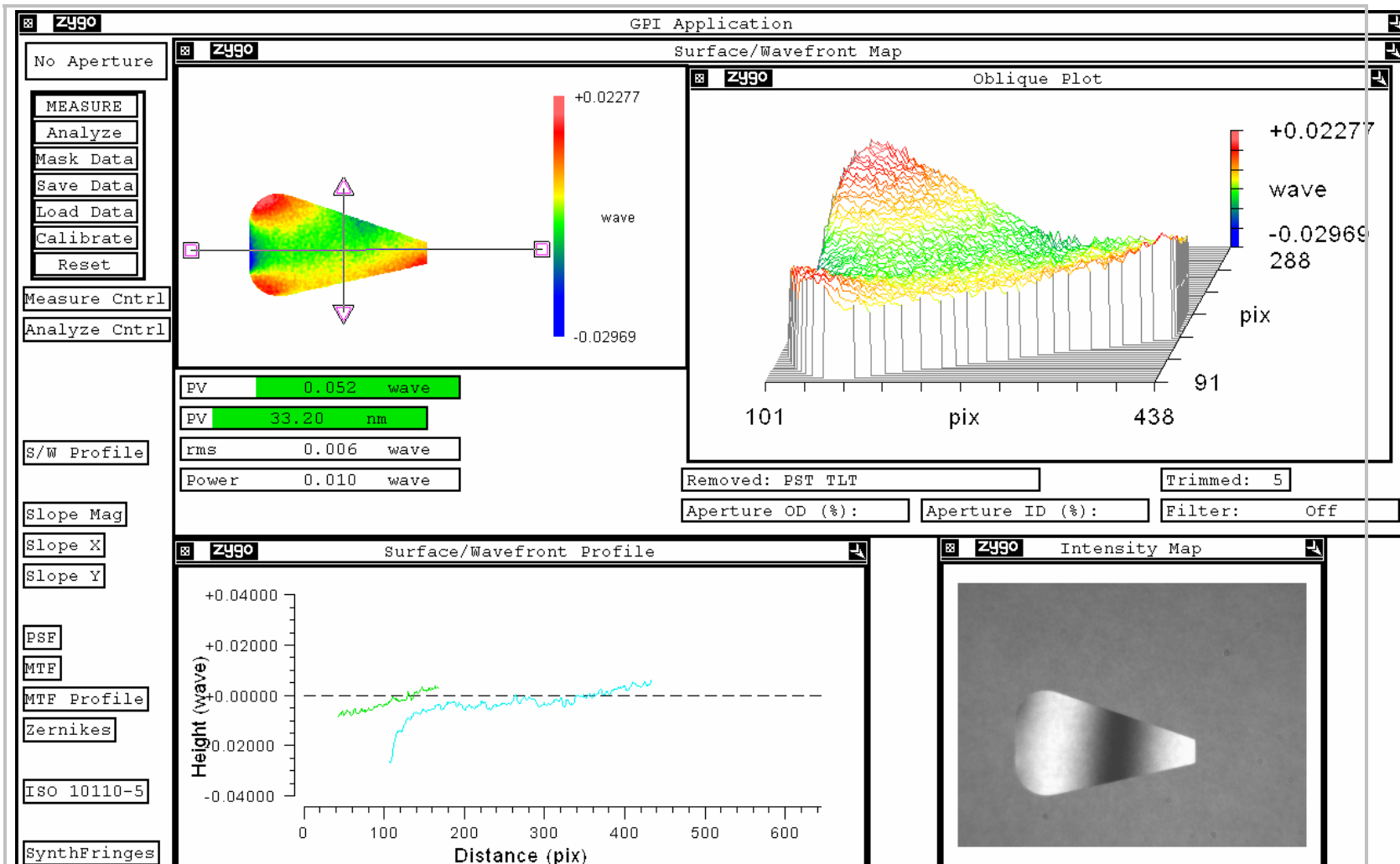
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B 4 flatness 0.052 λ



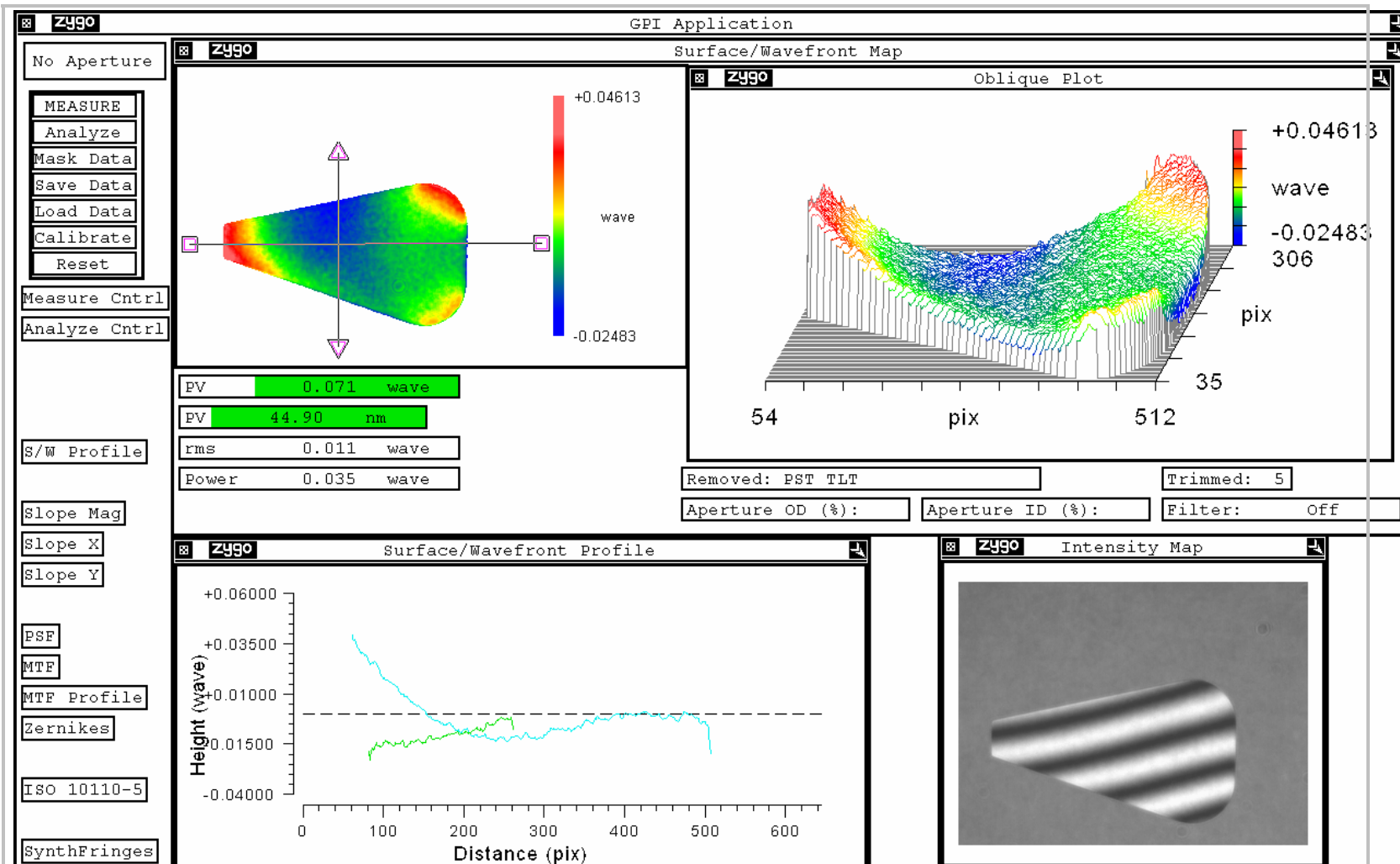
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B 5 flatness 0.052 λ



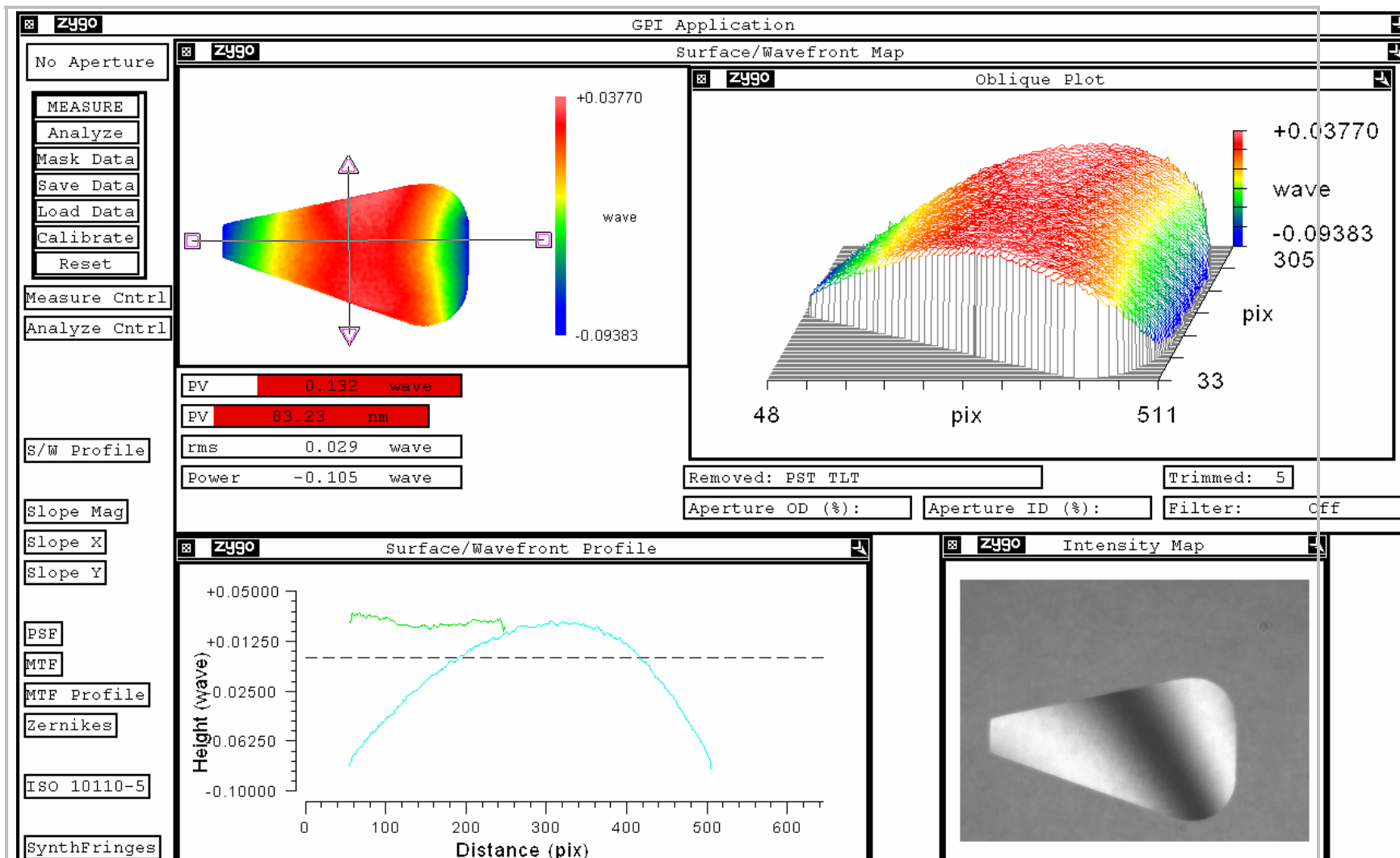
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B 6 flatness 0.071 λ



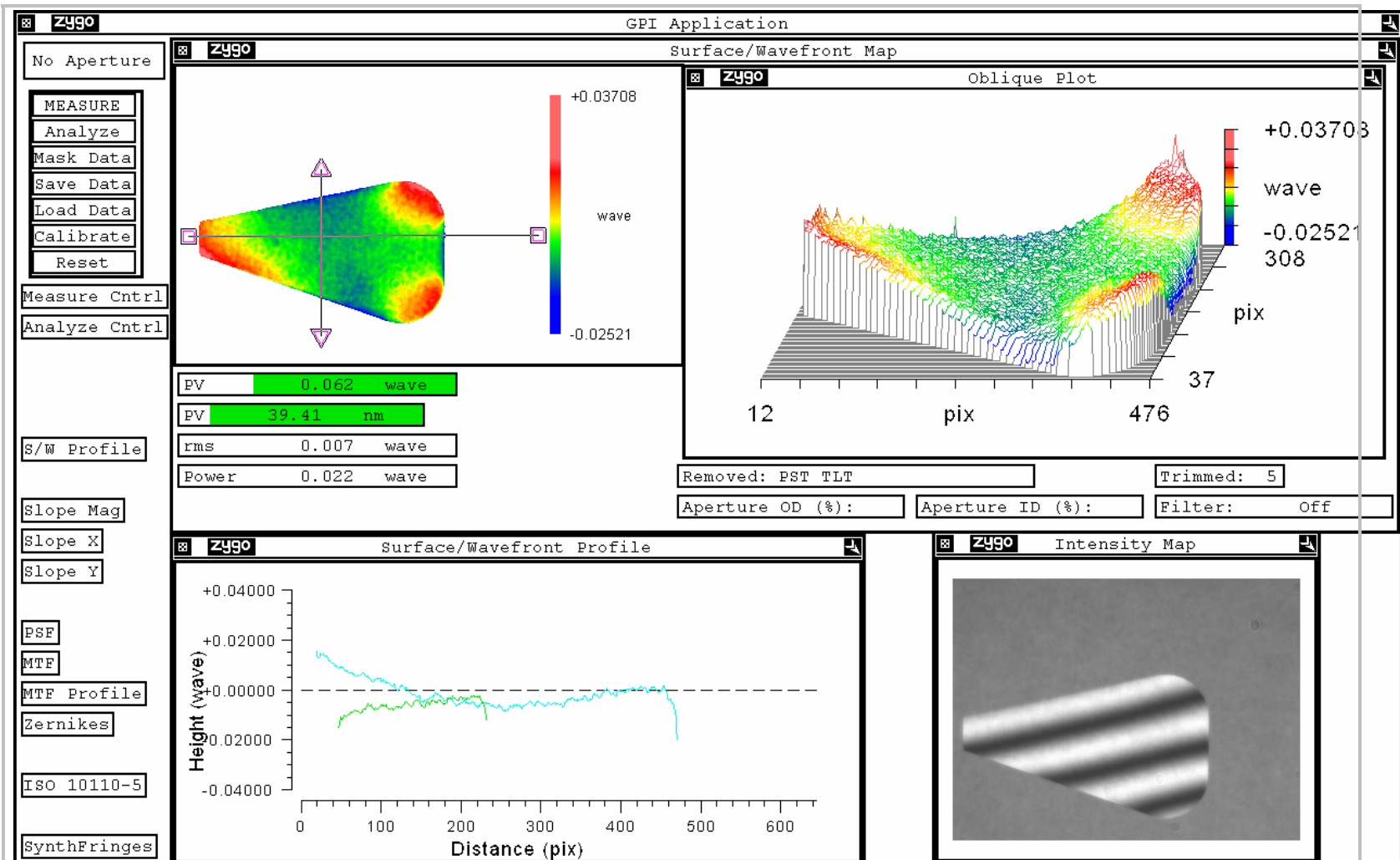
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B 7 flatness 0.132 λ (major failure)



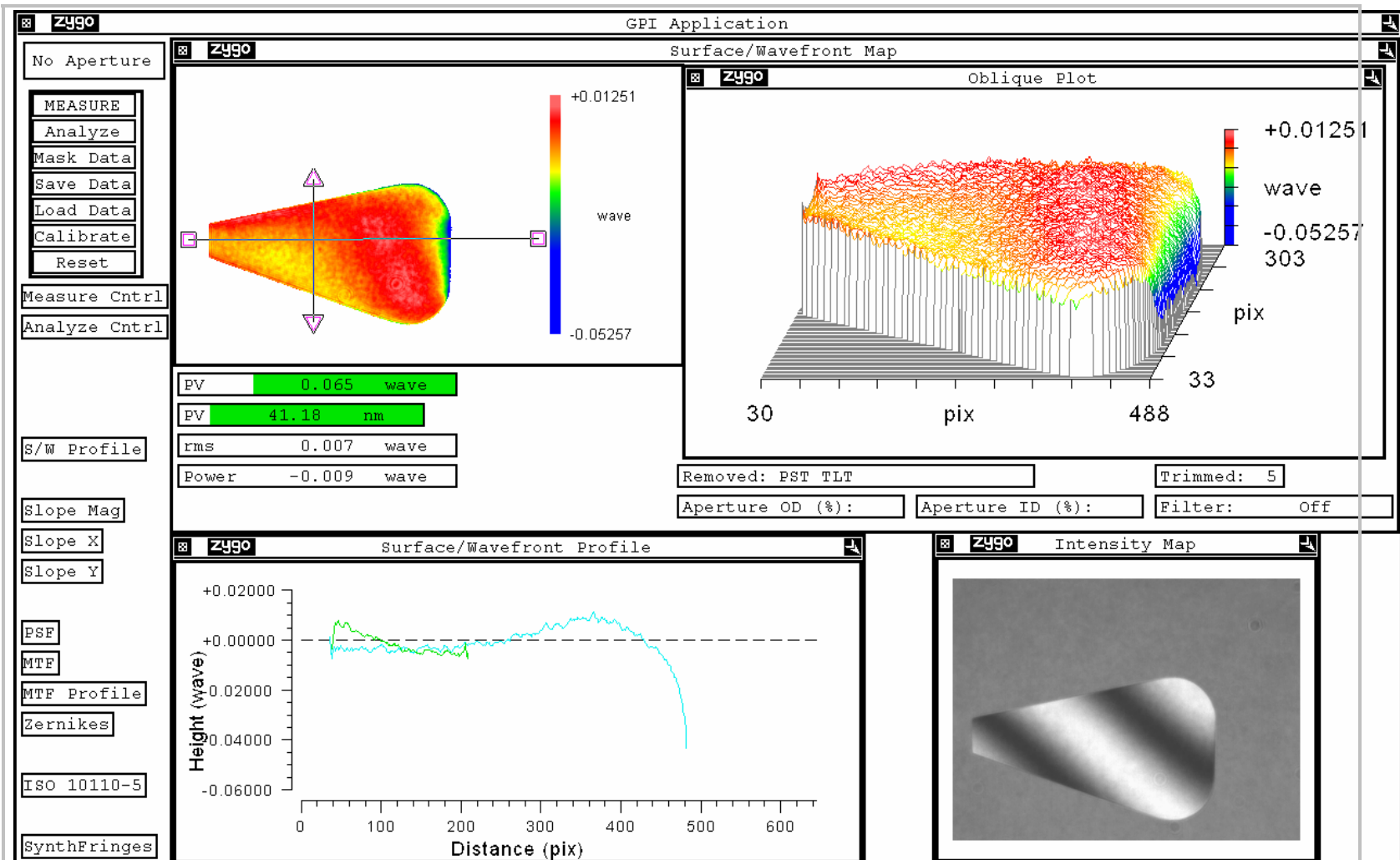
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B 8 flatness 0.062 λ



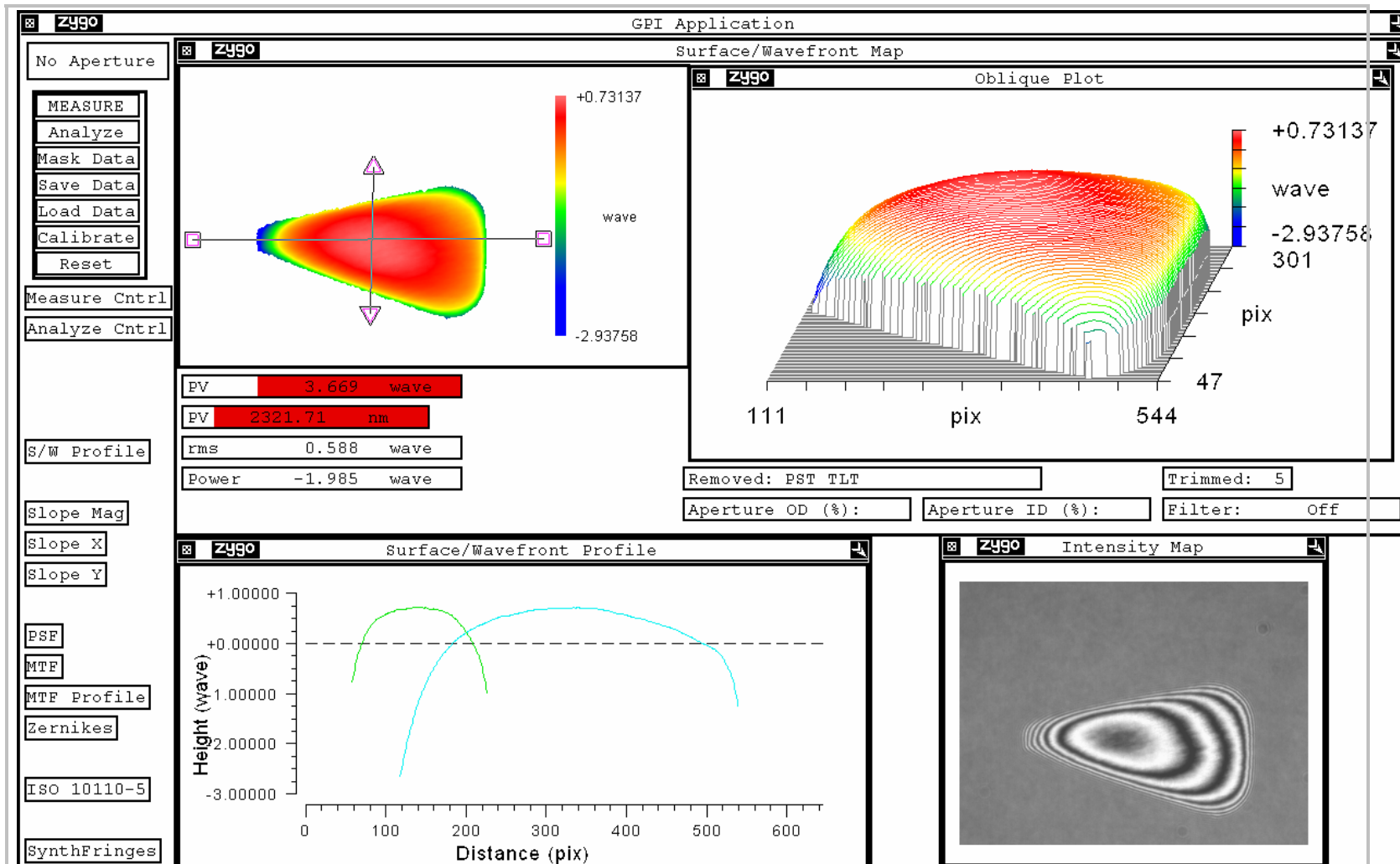
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B 9 flatness 0.065 λ



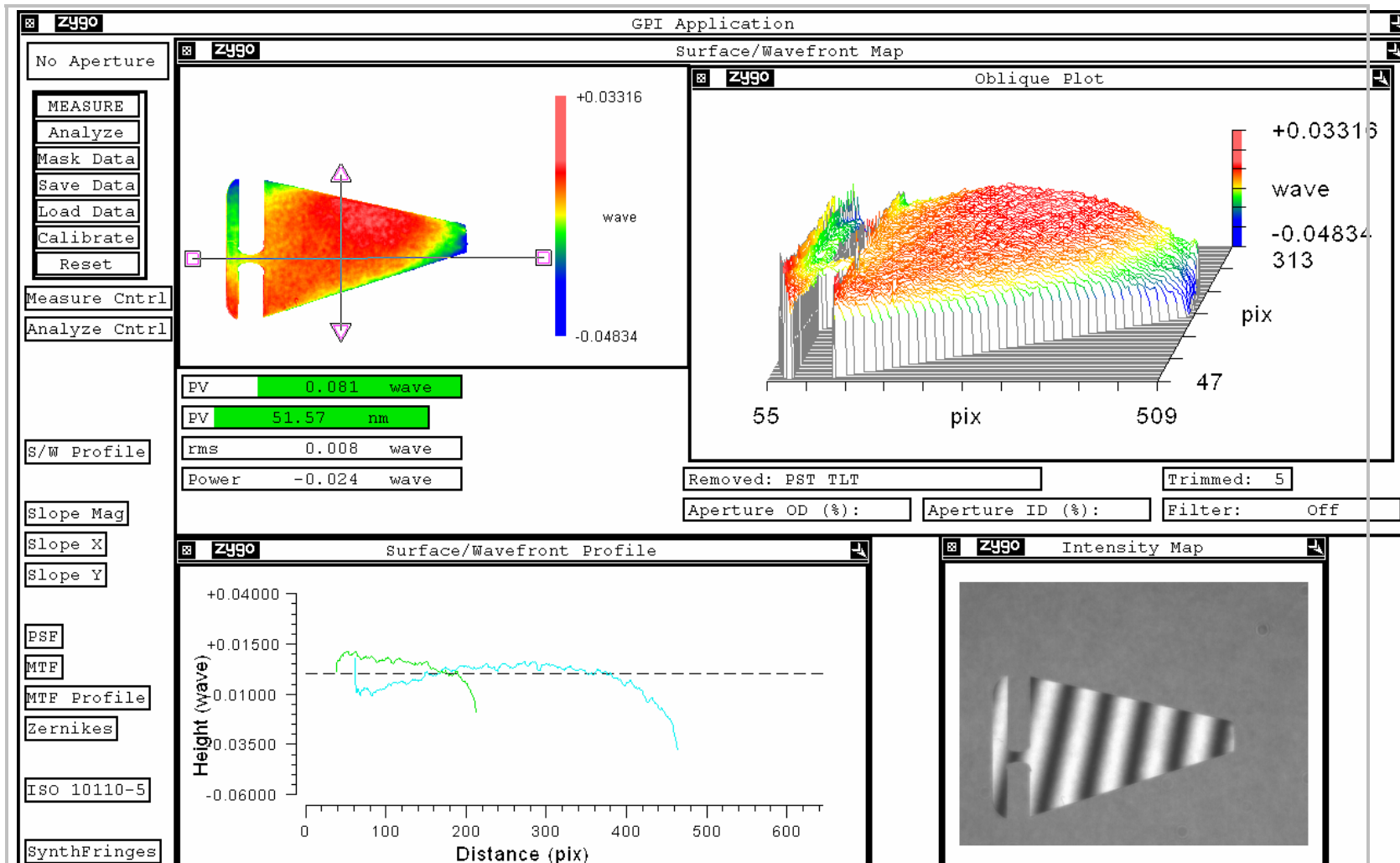
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B 10 flatness 3.669 λ wrong side polished



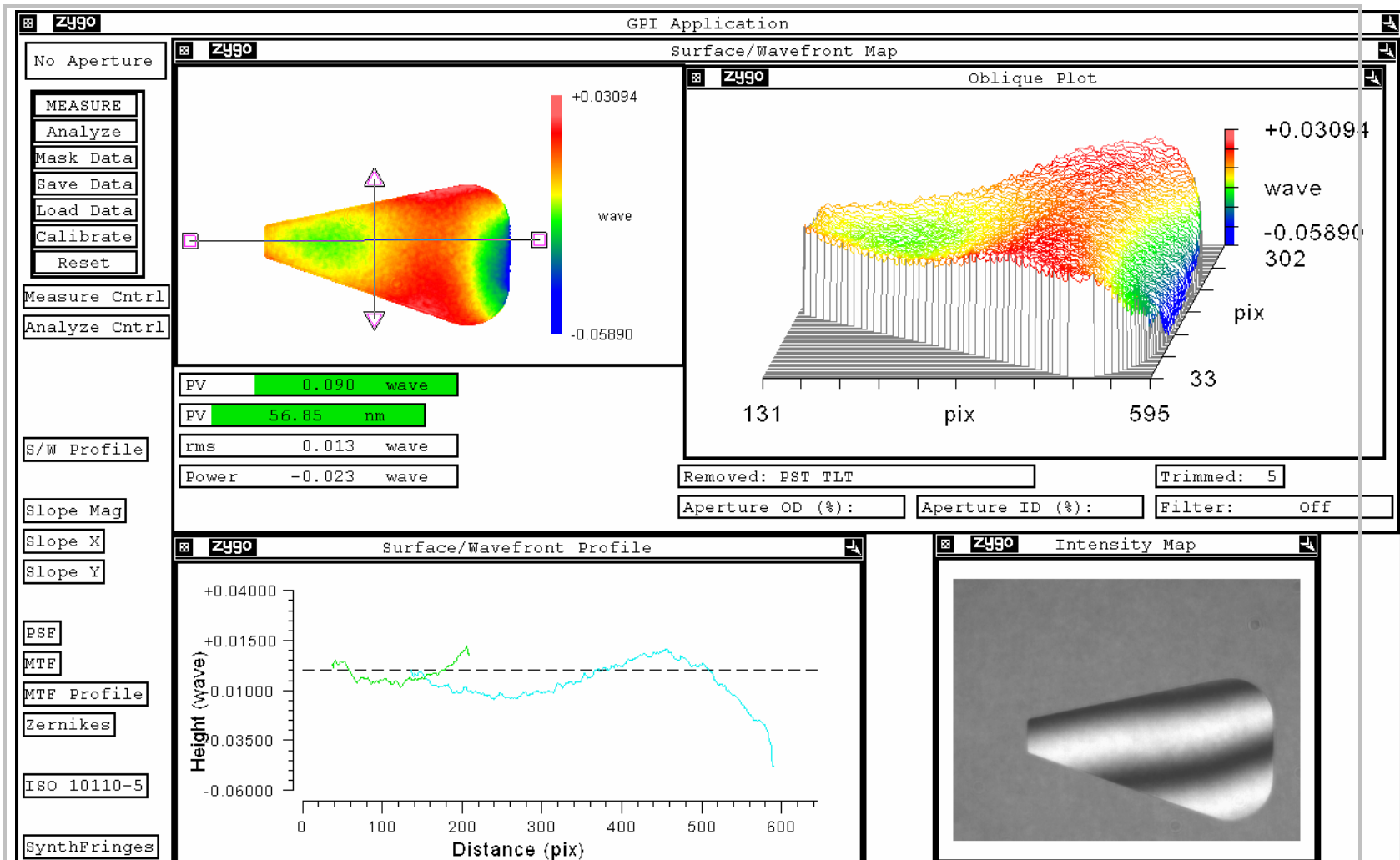
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B12 other side showing cutout caused by positioning pins, flatness 0.081 λ (may be mislabeled 'A')



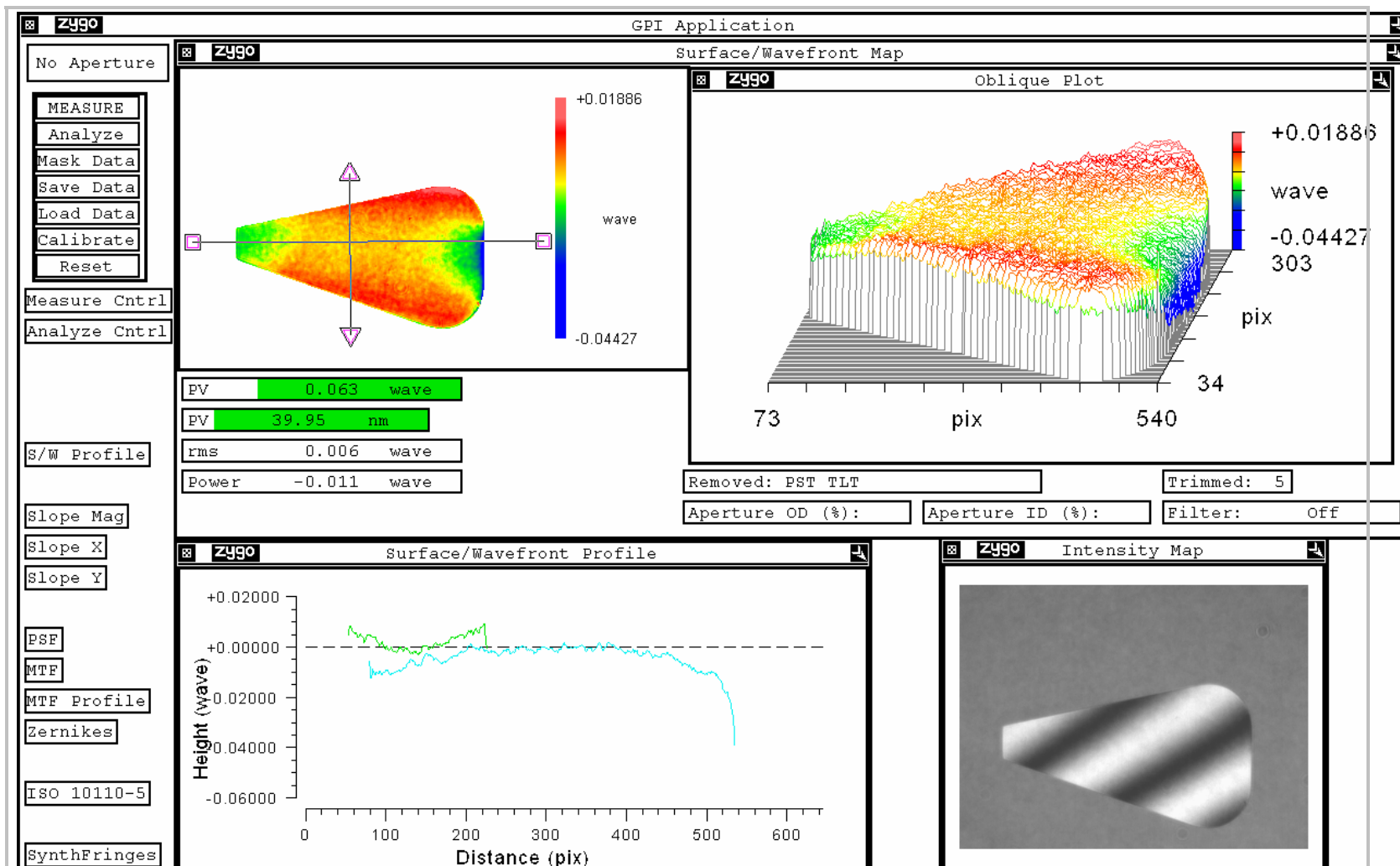
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B 11 flatness 0.09 λ



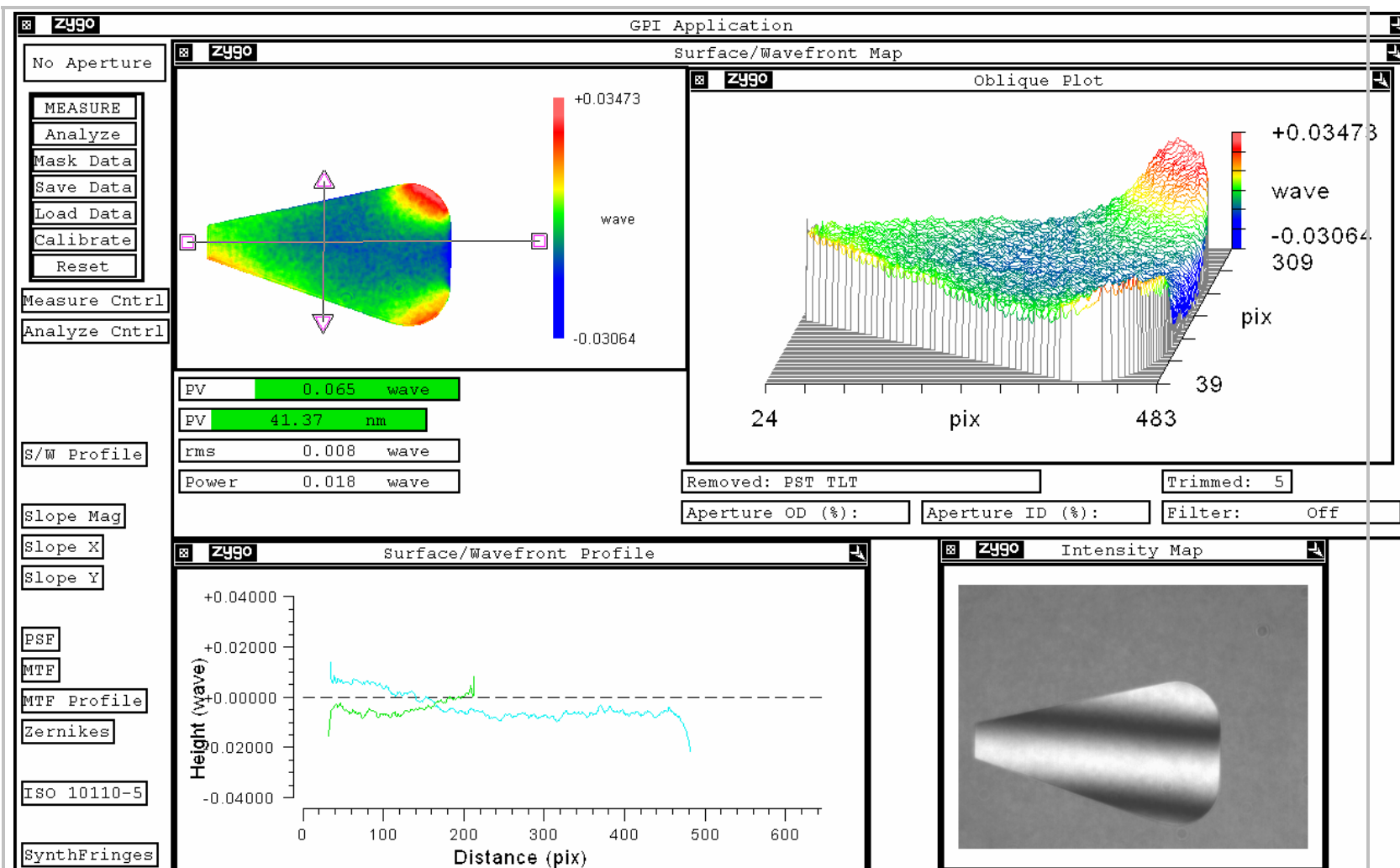
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B 12 flatness 0.063 λ



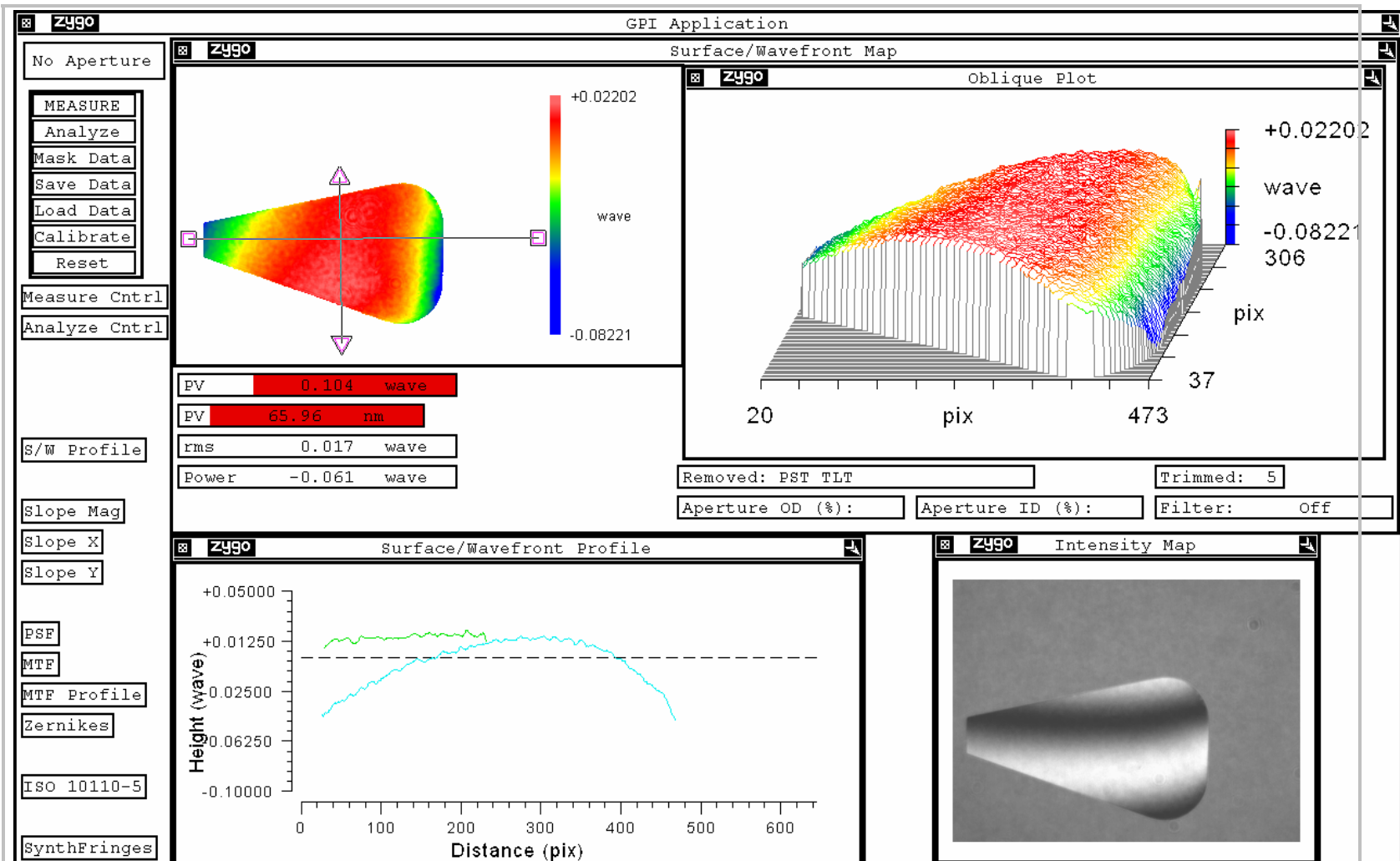
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B 13 flatness 0.065 λ



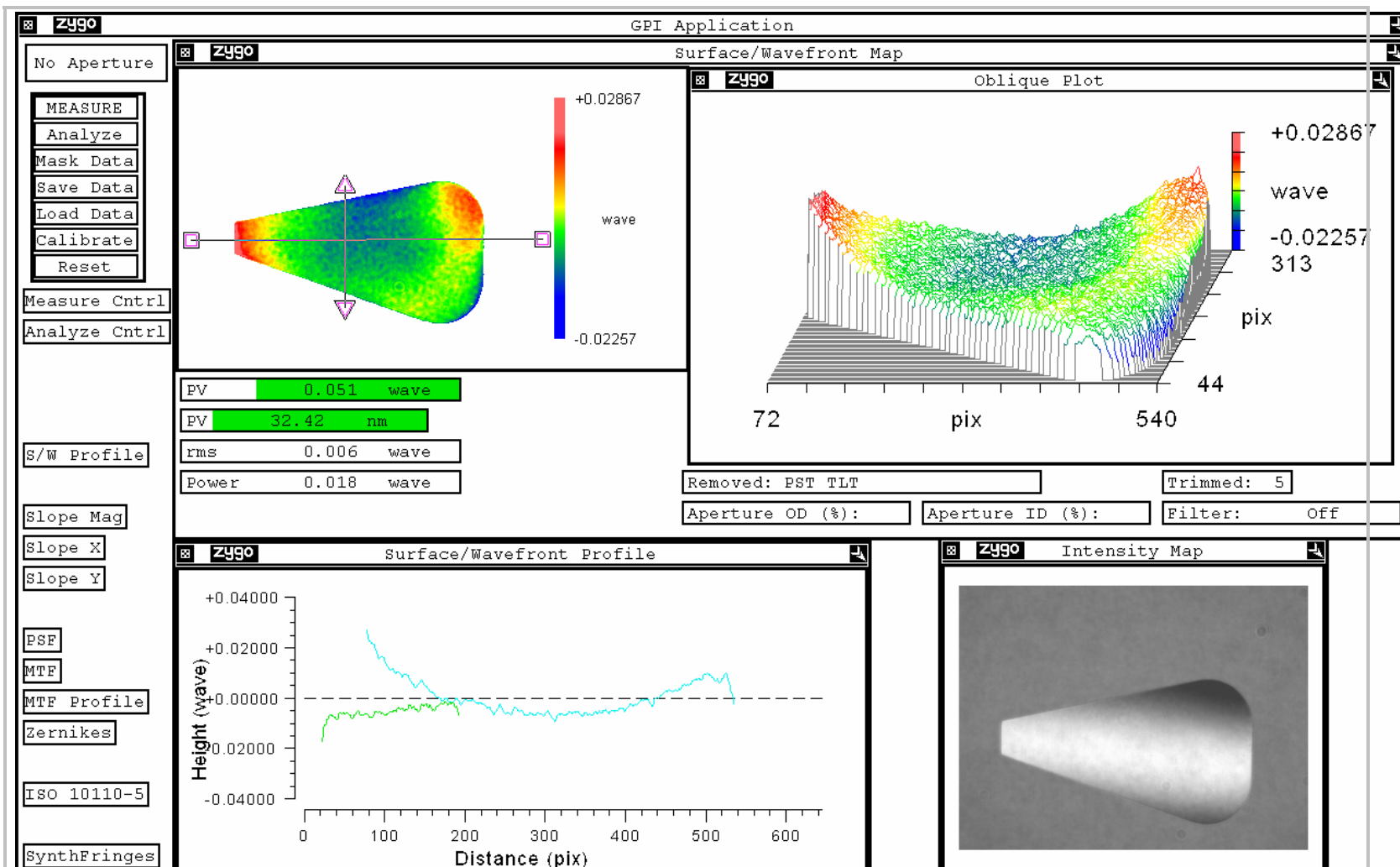
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B 14 flanness 0.104 λ (marginal fail)



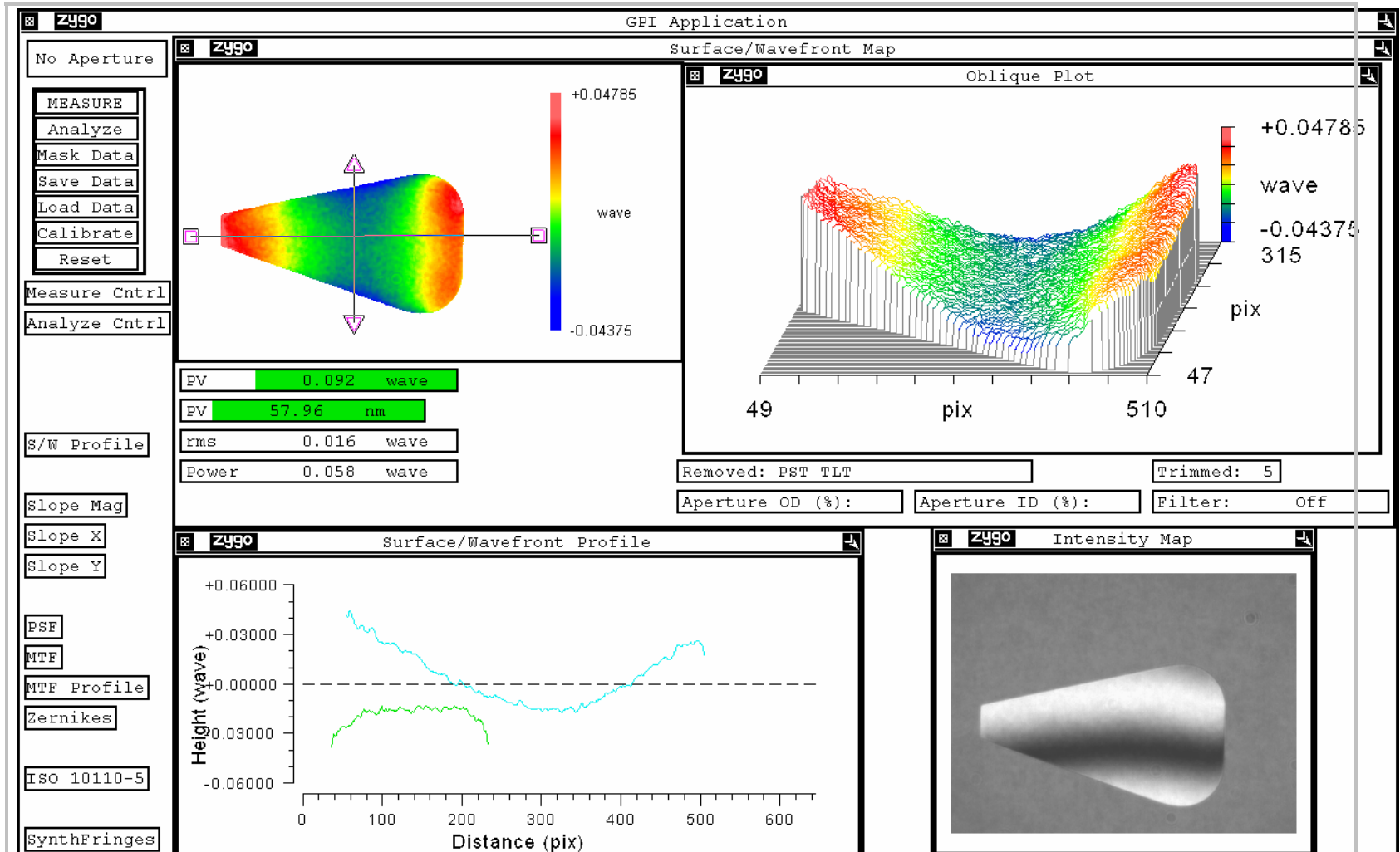
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B 15 flatness 0.051 λ



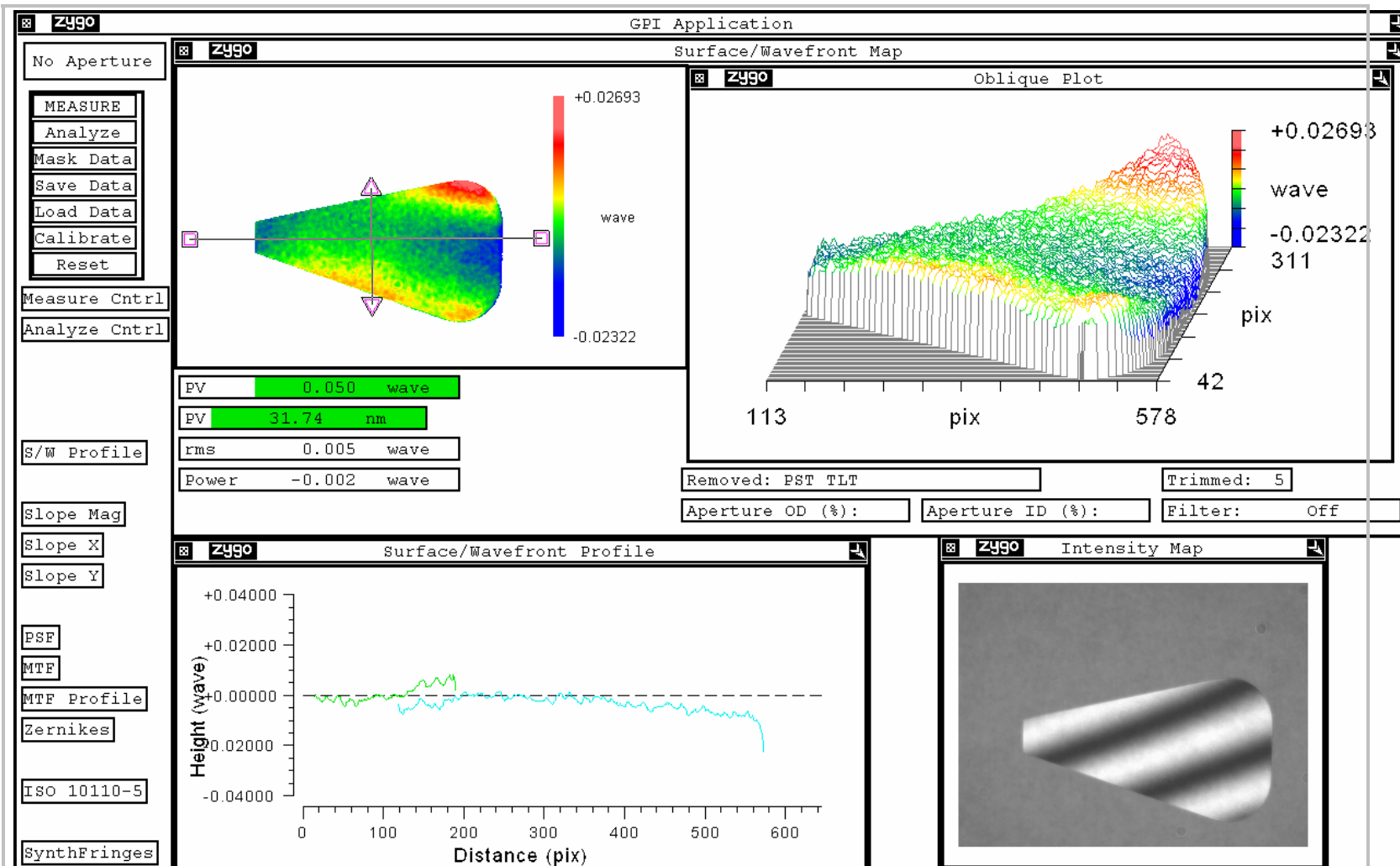
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B 16 flatness 0.092 λ



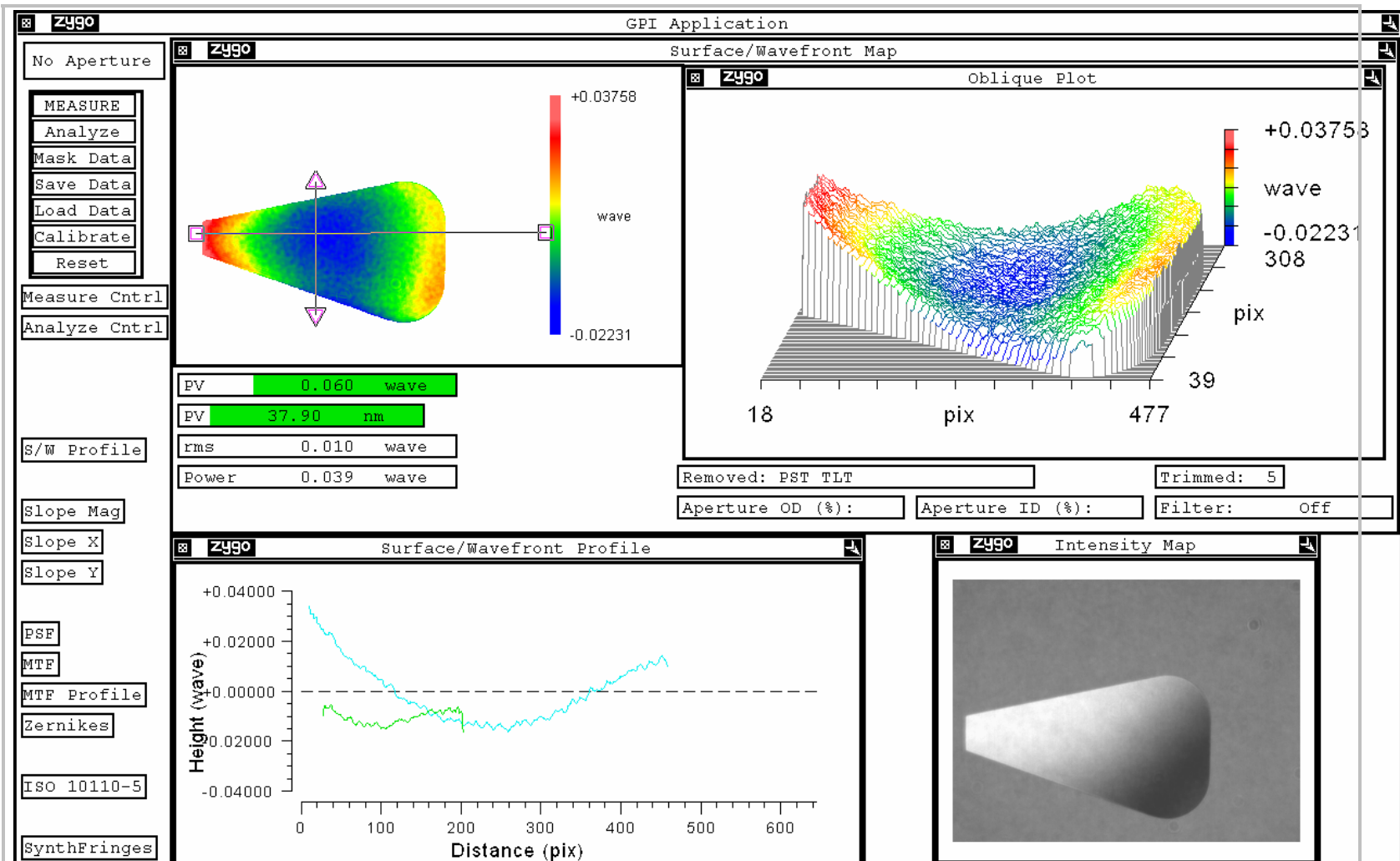
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B 17 flatness 0.05 λ



Test report on flatness of 'B' ears for Advanced LIGO monolithic suspension



B 18 flatness 0.06 λ