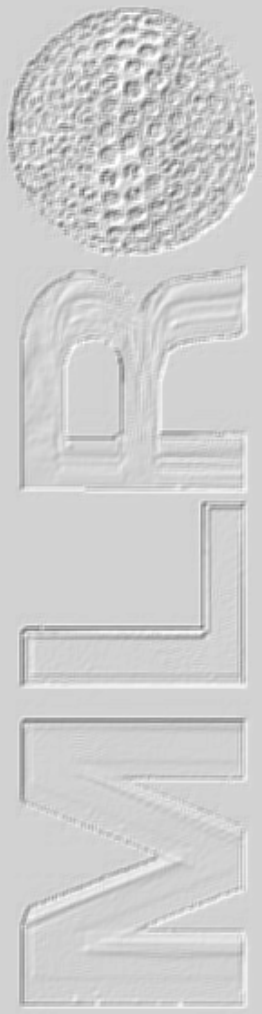


Status report

G. Bianco

ASI/CGS, Matera, Italy

T. Oldham

HTSI, Lanham, MD, USA

13th International Workshop on Laser Ranging

Washington DC, USA, 7-11 October 2002

MLRO

MLRO specifications

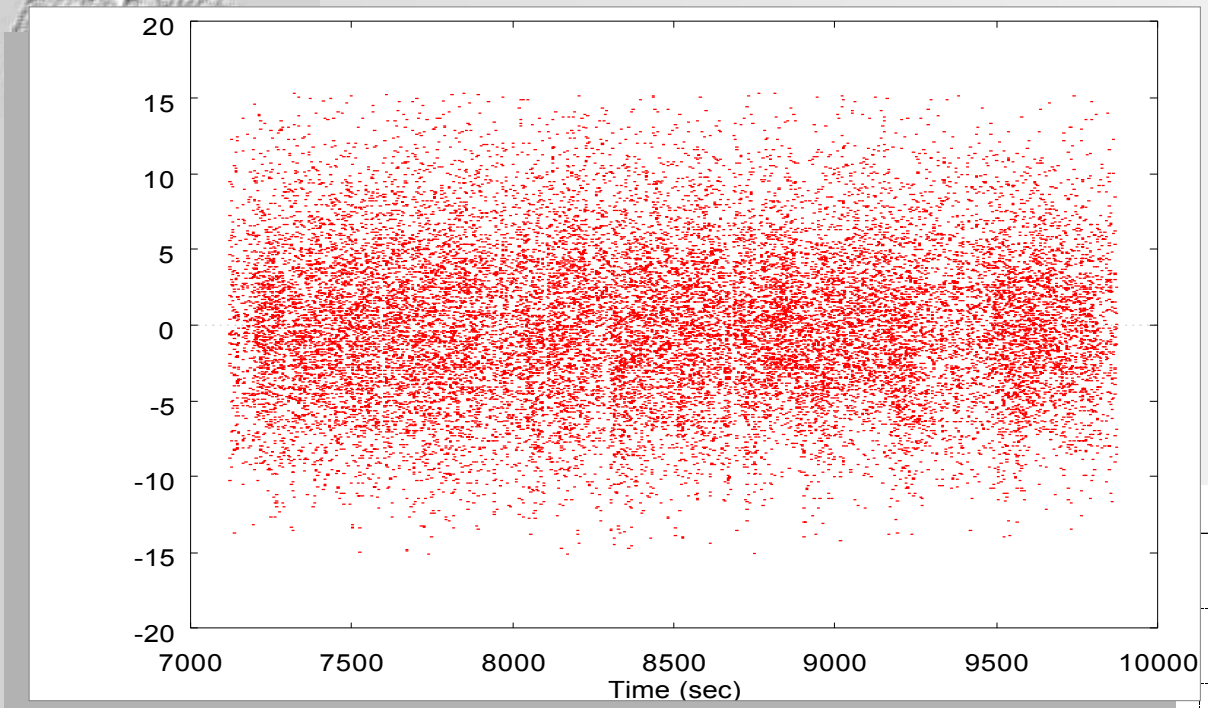
- Astronomical quality telescope, 1” pointing accuracy, 1.5 m aperture
- Day & night, 1- and 2-color ranging capability to satellites from 400 km orbit to the Moon
- Single-shot RMS jitter
  - **≤ 5 mm on LAGEOS (≤ 1 mm NP)**
  - **≤ 5 mm on Starlette, ERS (≤ 1 mm NP)**
  - **≤ 15 mm on Etalon, Glonass (≤ 3 mm NP)**
  - **≤ 15 mm on Moon (≤ 10 mm NP)**

MLRO performance test

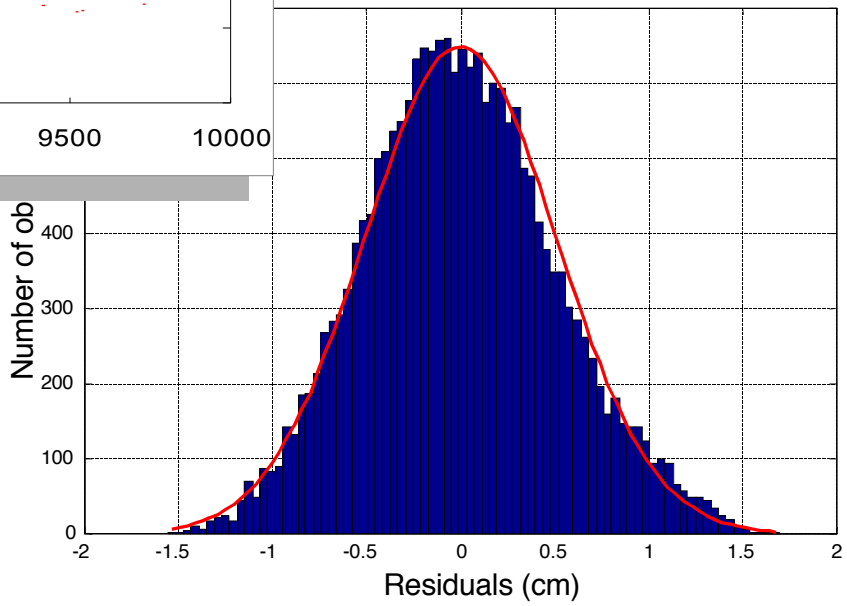
- Performance tested at GGAO during collocation (1998) and at the ASI/CGS (2000)
- Statistics from GGAO collocation

	Full-rate		**Normal points**	
	Mean(mm)	# pass	Mean(mm)	# NP
LAGEOS	4.96 ± 0.51	76	0.30 ± 0.003	2778
Starlette, ERS	4.28 ± 0.51	16	0.41 ± 0.017	75
Etalon, GLONASS	8.72 ± 0.31	51	0.41 ± 0.017	355

LAGEOS II observations from MLRO



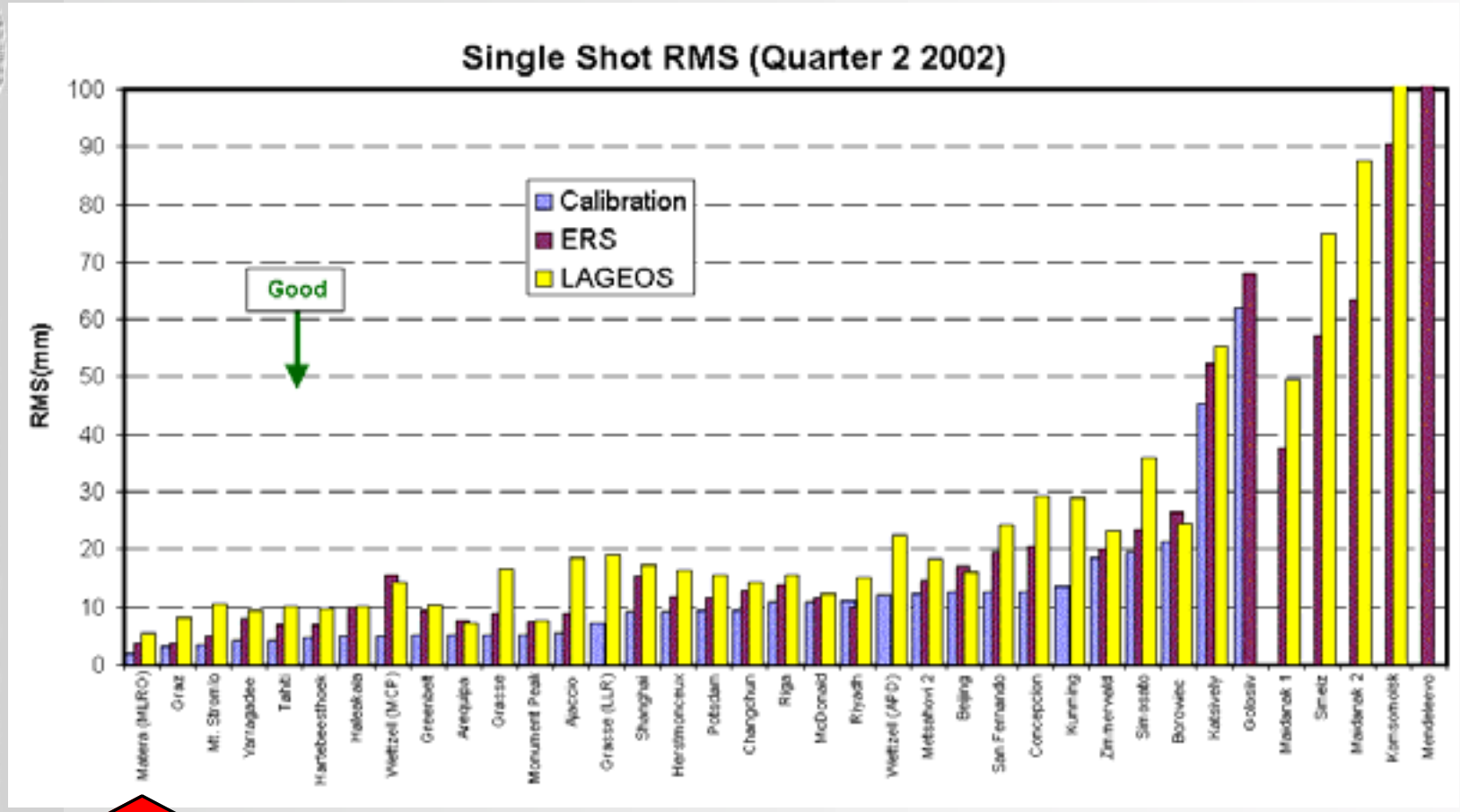
Lageos 2 pass on 98/10/15
pass length = 46 min.
number of obs. = 21945
return rate = 80%
rms= 5.08 mm
skewness = 0.17
kurtosis = -0.13



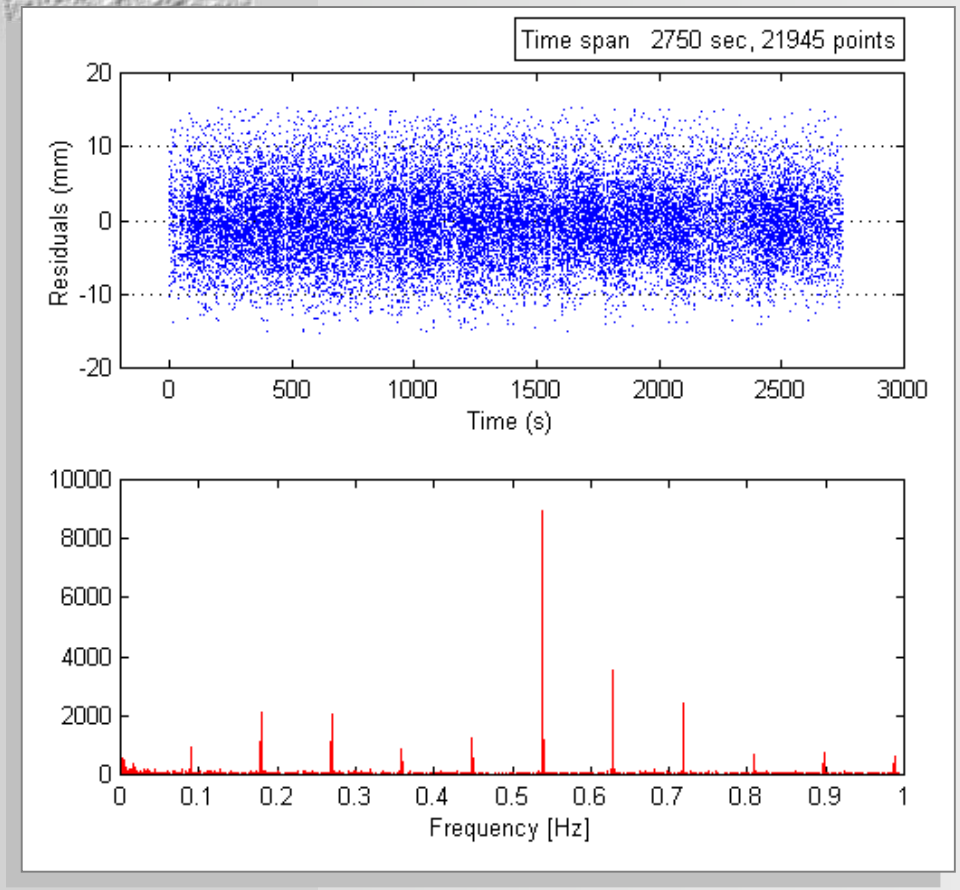
MLRO status report

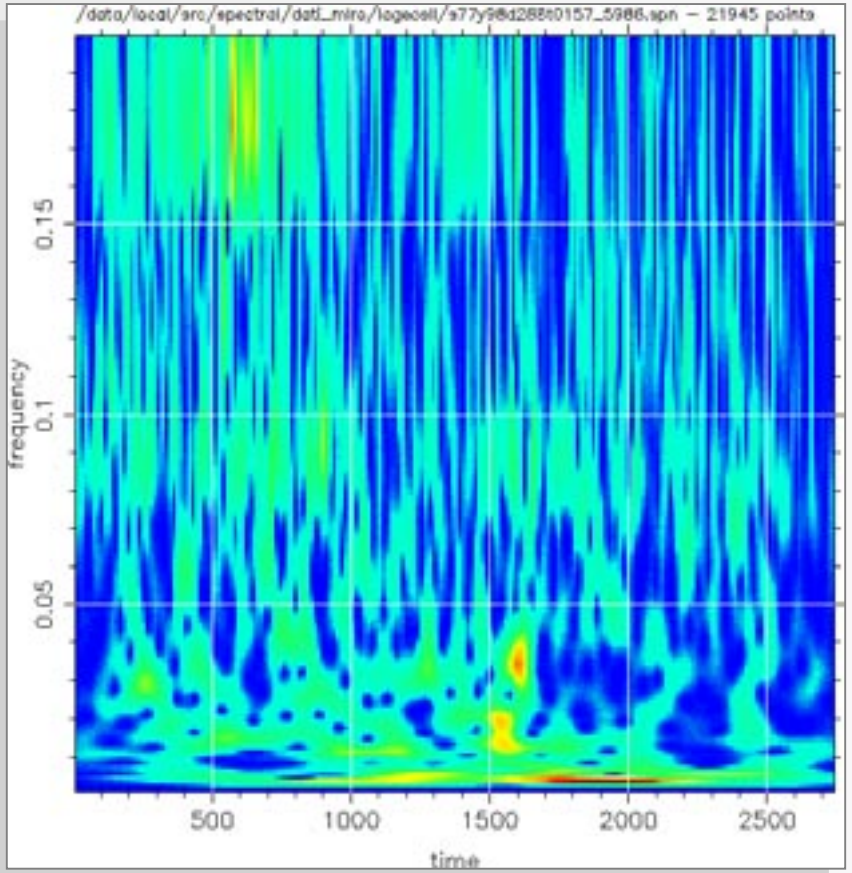
- System is producing good quality data
- 2-color PMT configuration operational
- 2-color streak camera configuration operational (several passes tracked)
- LLR configuration operational (Moon tracked)
- System currently undergoing final acceptance tests

ILRS network performances



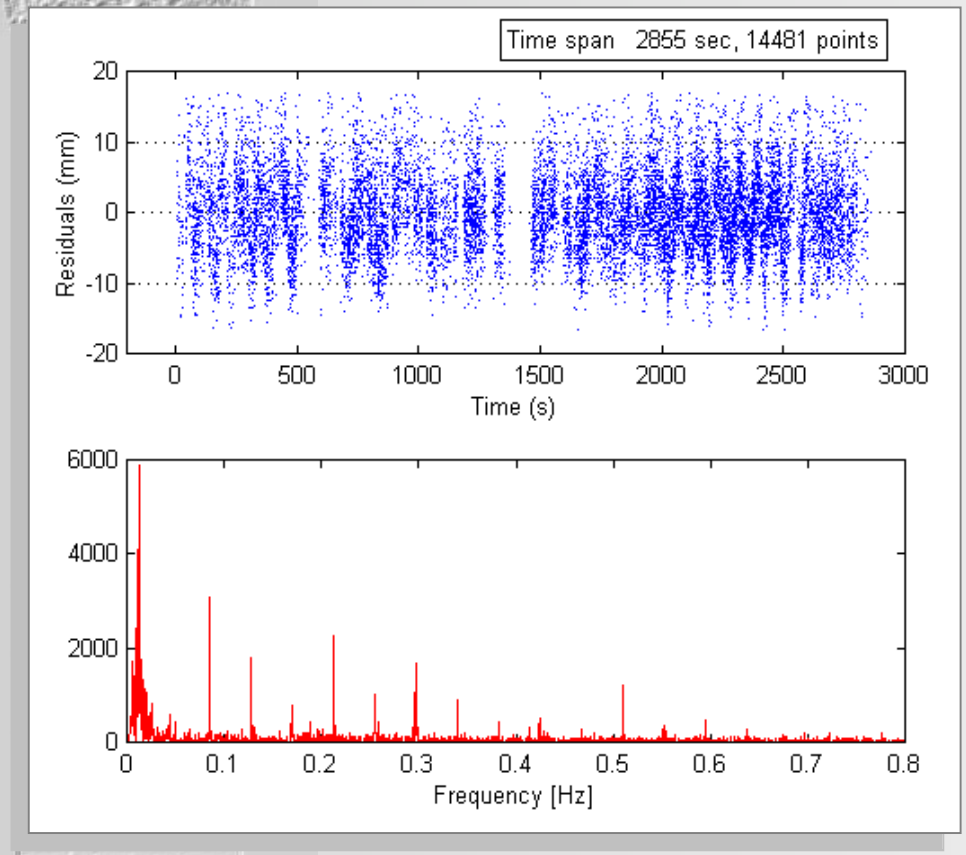
LAGEOS II residuals: spectral signature from rotation
(October 15, 1998)

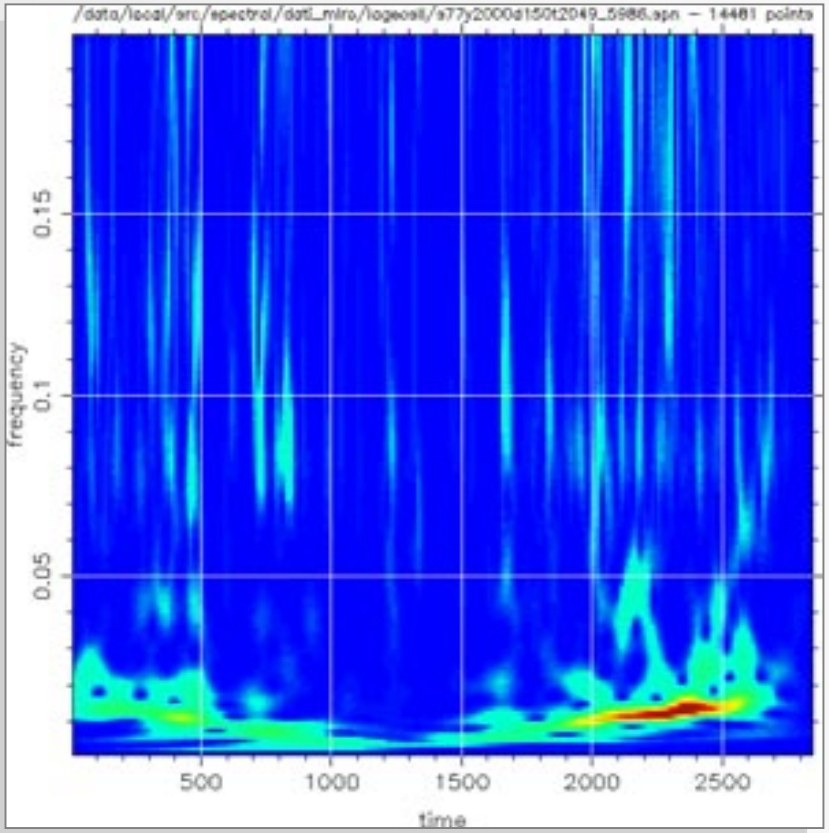




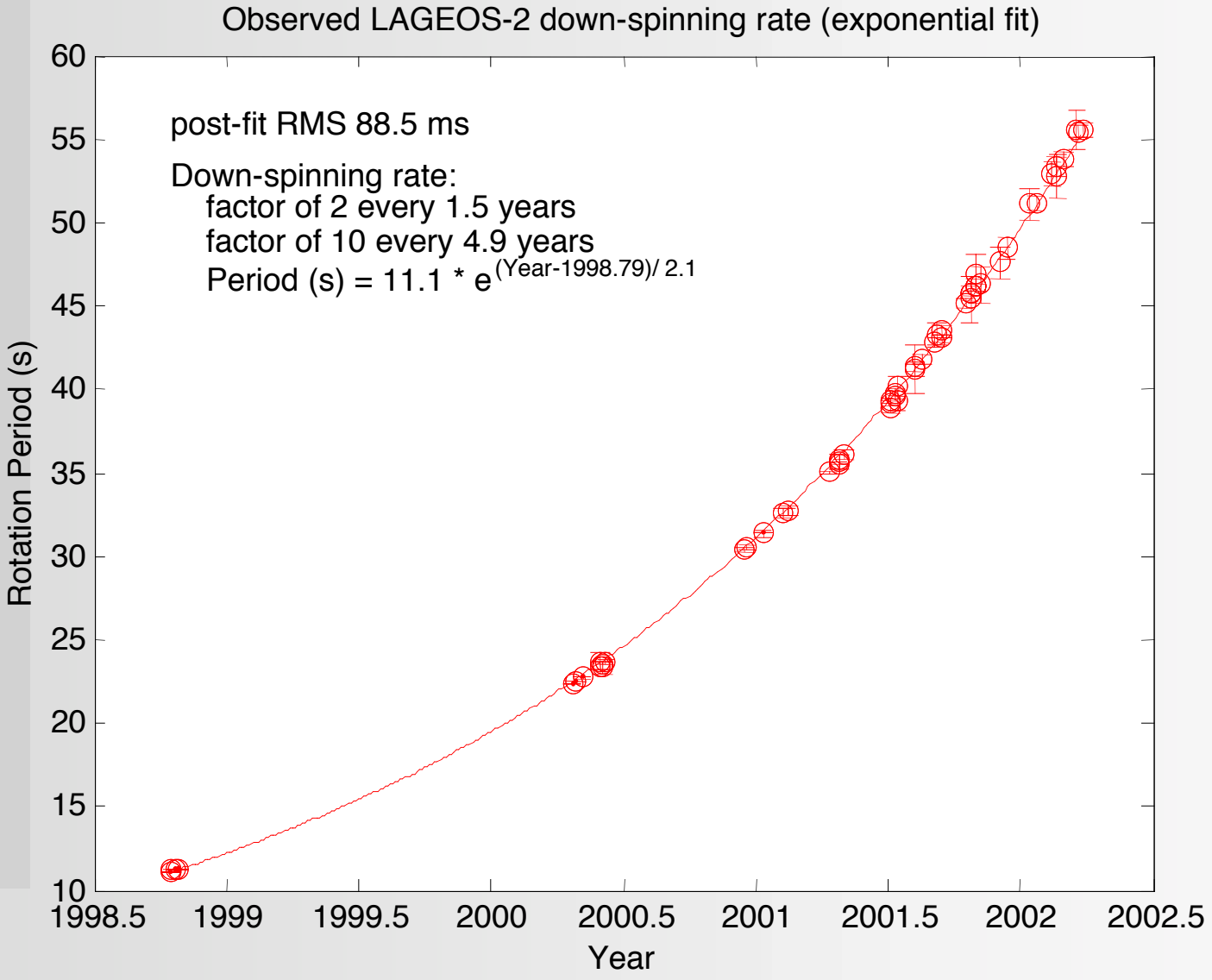
LAGEOS II residuals: spectral signature from rotation

(May 29, 2000)

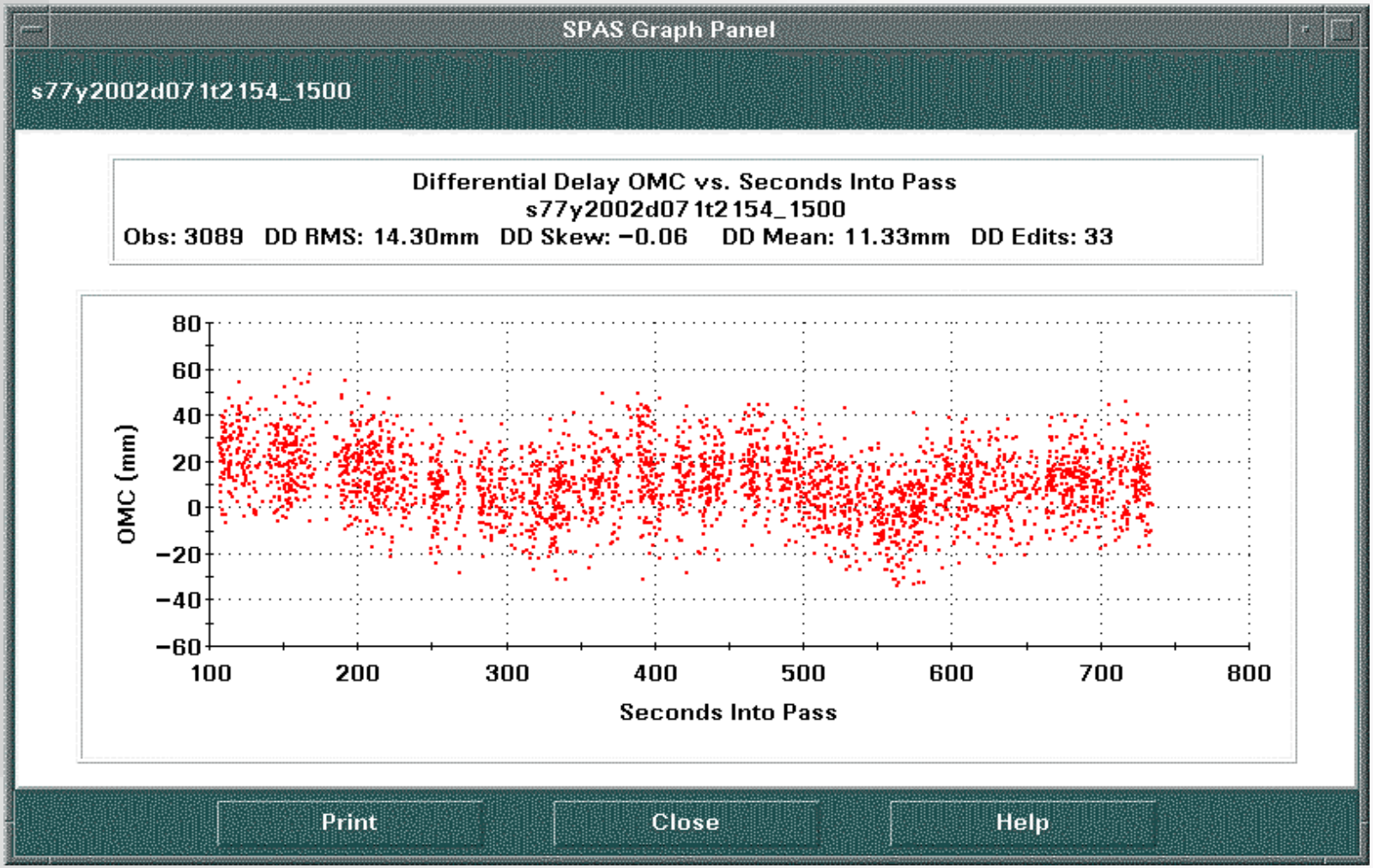




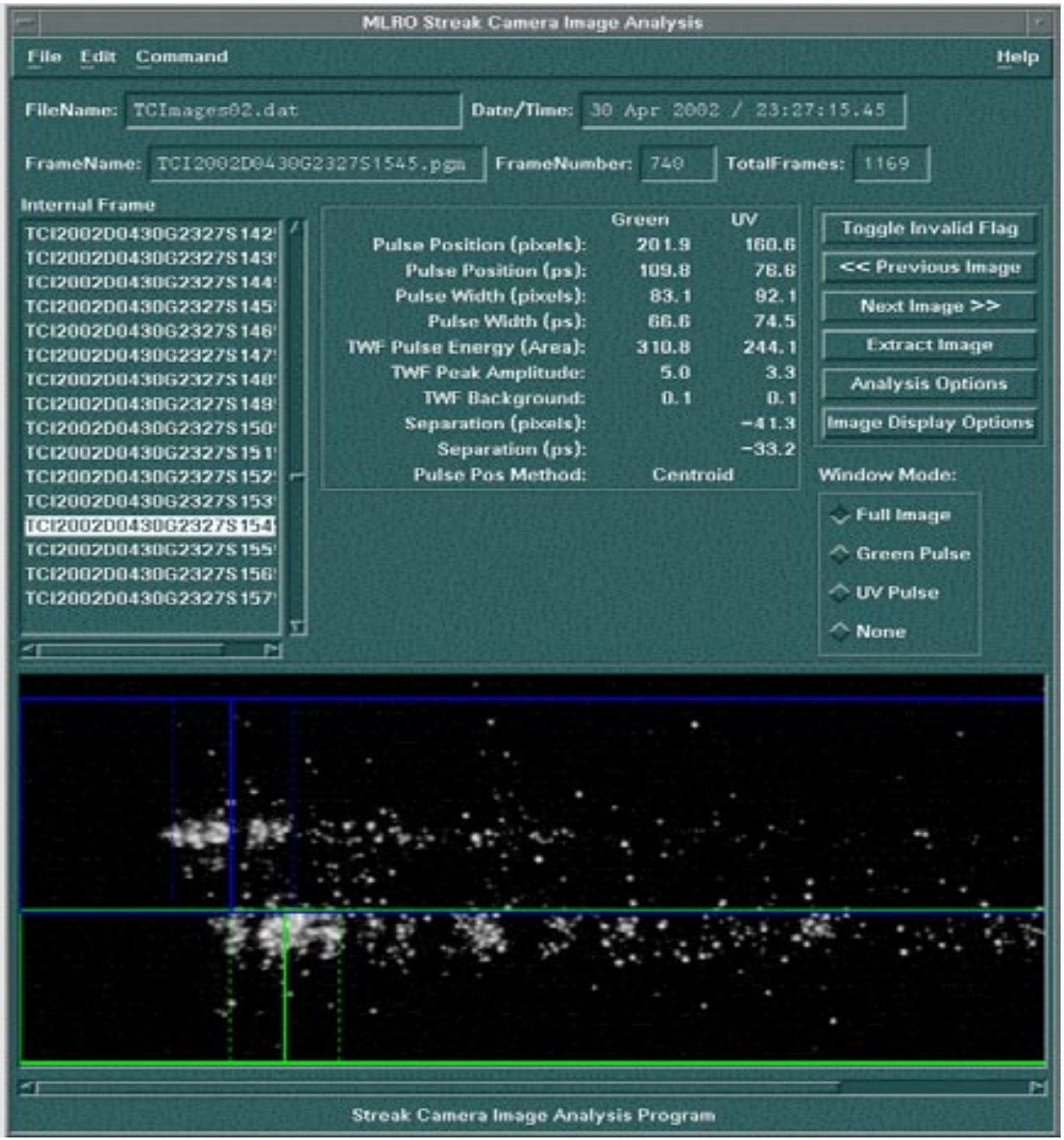
Observed LAGEOS II down-spinning rate



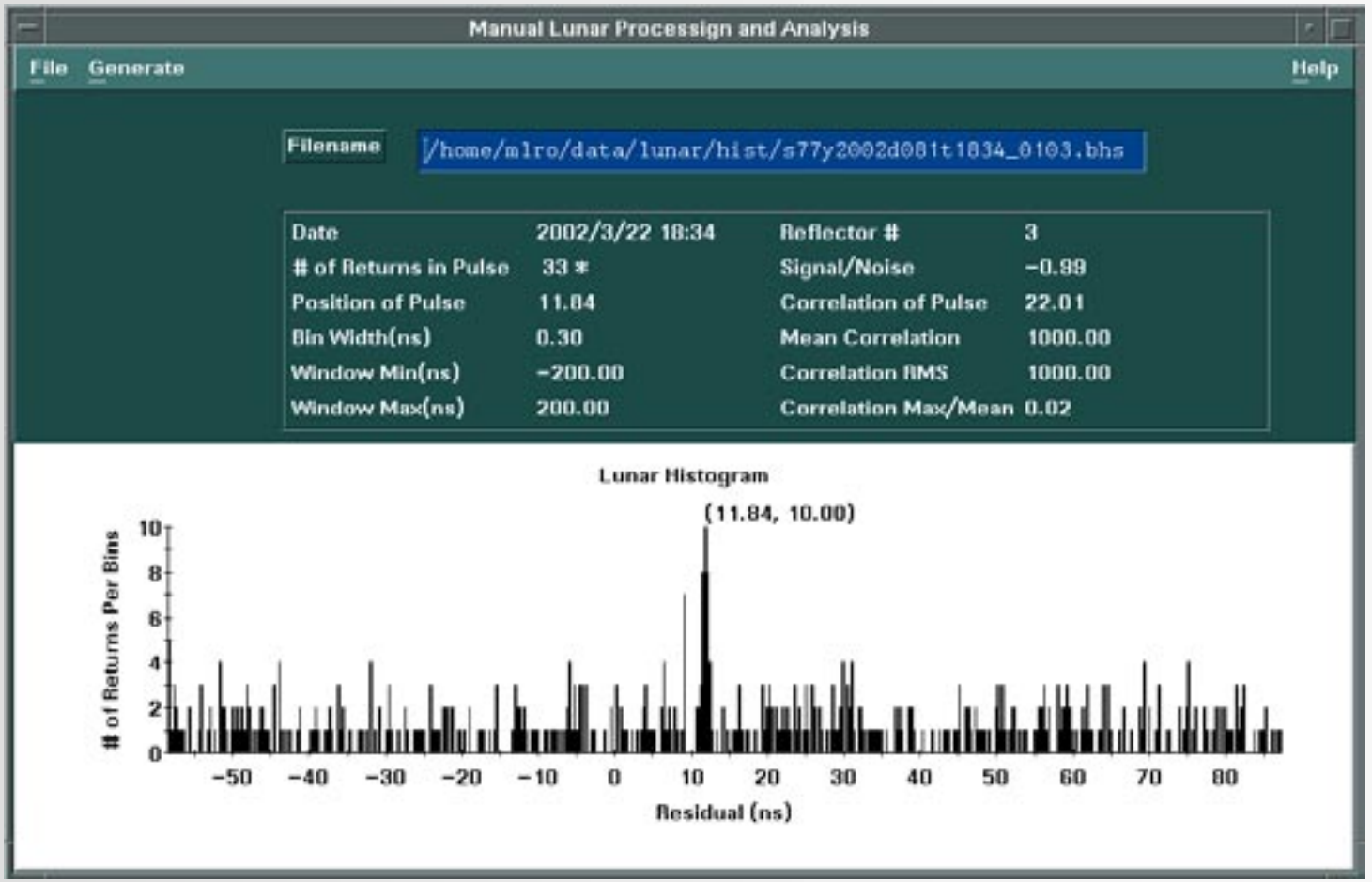
Shot by shot differential refraction (green-UV) residuals w.r.t. Marini-Murray AJISAI – dual PMT mode



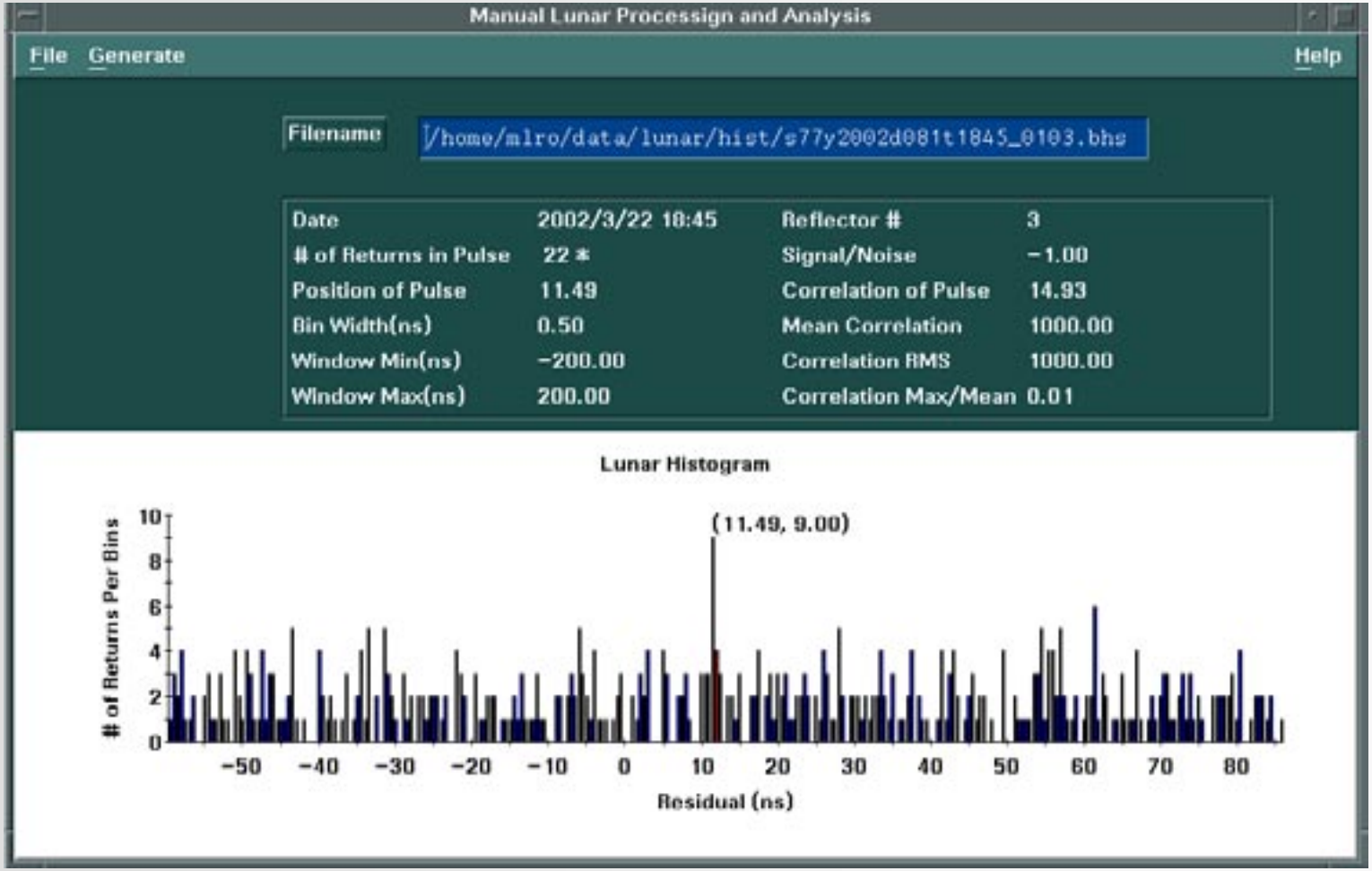
Streak camera dual pulse (green-UV) from TOPEX-Poseidon



MLRO lunar observations



MLRO lunar observations



Conclusions

- Millimeter-level single shot precision
- High observational efficiency
- Millimeter level signatures detection in the residuals
- Two-color capable (355 & 532 nm)
- Moon observed, yet still critical