Status of KACST SLR Program
Past, Present and Future

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Where are we?
The SALRO site Solar Village, Saudi Arabia.

Solar Village is some 45 km north west of Riyadh. Photography date is July 9, 2002, whilst tracking Etalon 2 Satellite after dusk. The site is currently operated primarily during daylight and early evening.
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LASER AND RECEIVER

LASER:
TYPE: Continuum Nd:YAG YG501C
Oscillator: Active / Active mode locked
Pulse width: 80-250 ps, nominal 110 ps
Repetition Rate: 1 to 15 Hz
Pulse Energy: 100 mJ

RECEIVER:
Detector: CSPAD
Filters: 1.5 Angstrom
SALRO PRODUCTIVITY PERFORMANCE 1996 TO PRESENT

- Number of satellites
- LO orbit
- HIGH orbit
- LAGEOS
- RE-COMISSIONING
- FAT BY NASA REPRESENTATIVES
- SITE CLOSED
- Detector changed to MCP
- Two shift operation

Data points:
- Jan-96
- Jun-96
- Nov-96
- Apr-97
- Sep-97
- Feb-98
- Jul-98
- Dec-98
- May-99
- Oct-99
- Mar-00
- Aug-00
- Jan-01
- Jun-01
- Nov-01
- Apr-02
SALRO RMS 1996 TO PRESENT

- LAGEOS (RMS)
- GPS (RMS)
- LO (RMS)

Using MCP

Major breakdown

operation commence

SALRO temporarily closed

MORE TUNING IN THE FUTURE TO OPTIMUM
SALRO Hi-Orbit SLR, by year

NOTE: 2002 to end of August ONLY
ILRS Q2 (2002)
ILRS Q2 (2002)

Minutes of Data (Jul-2001 to Jun-2002)

- High
- LAGEOS
- LEO

Good
Yarragadee vs Salro NP for different satellites during 2001

- AJISAI
- BE-C
- ERS-2
- ETALON-1
- ETALON-2
- GFO-1
- GLONASS-78
- GLONASS-40
- GLONASS-34
- GPS-35
- GPS-36
- LAGEOS1
- LAGEOS2
- STARLETTE
- STELLA
- TOPEX
- WESTPAC

Yarragadee Normal Points
SALRONormal Points
Yarragadee vs Salro Number of passes of different satellites (2001)
RMS IMPROVEMENT

- PULSE JITTER REDUCTION
- INSTABILITY OF LASER
- TUNING AOM
- DISCRIMINATOR ADJUSTMENTS
- REDUCE TURNING MIRRORS
- TEMPERATURE STABILITY FOR ELECTRONICS
FUTURE OUTLOOK

- Boost productivity by expanding operations to cover 2 shifts 5 days per week
- Re-survey the site, work to remove any residual errors in adopted site coordinates
- Analyze and tune to eliminate systematic errors, range biases .. etc.
- Engineering improvements to the telescope (sun shield), AC/ refrigeration system etc.
Site development to include MicroCosm analysis capability, GPS calibration.. etc.

Collaboration with national and international institutes;

Ω The landmass – subsidence, gravity etc.
Ω Orbital mechanics.
Ω Relativity.
Ω Earth rotation.
Ω etc.

Aircraft safety, radar system to eliminate mount observer.
THANK YOU