Mount Mapping at MLRS

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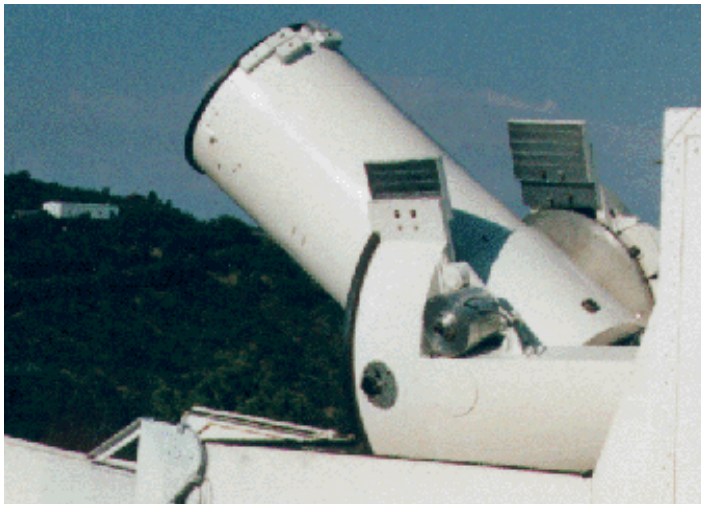
Introduction

- Telescope mounts require modelling (usually with stars) to produce adequate pointing
- MLRS's analytical model inadequate since replacing yoke axis Baldwin optical encoder with a Heidenhain linear encoder.
- Trying to develop new model terms to compensate failed
- Is there another way to improve the pointing?

MLRS Mount Model

- Mount configuration: X/Y (Alt over Alt)
- analytical model
  - Old 12 terms
  - Test 16 terms

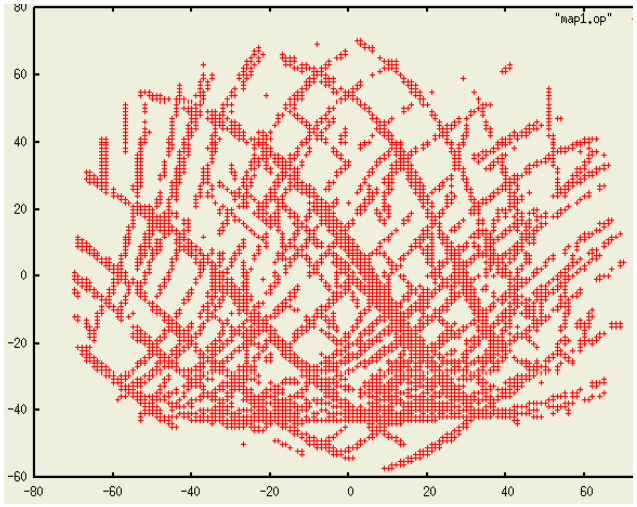


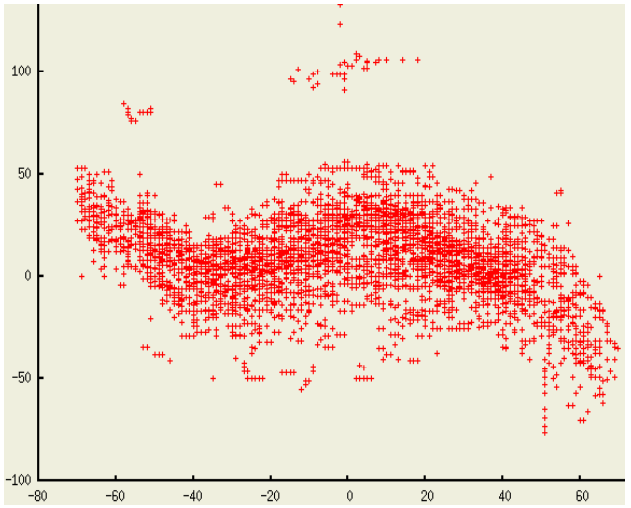
New Approach to Mount Modeling

- Use mount map in addition to existing analytical model (and existing coefficients)
- Create the map by data mining: find telescope hand paddle offsets corresponding to identified satellite ranges

Looking for patterns

- The data is from high satellites only
- The yoke axis handpaddle vs yoke angle shows a strong pattern
- Develop analytical term?
- No such pattern in the tube axis





Map Implementation Challenges

- Grid spacing.
  - Currently 1ºx1º
  - Larger? Elevation dependent?
- Which satellites? High? All?
- Type of interpolation for empty bins
  - Closest bins in each direction?
  - Real-time interpolation?
- Maintenance schedule and automation

Conclusion

- May be able to improve analytical mount model from data mining of ranging handpaddle data
- Mount mapping could overcome problem of modelling difficult-to-define mount behavior