



Stefan Riepl, Bernd Sierk
Bundesamt für Kartographie und Geodäsie
D-93444 Bad Kötzing, Germany



Caesar Guaitiao, Victor Mora
Universidad de Concepcion
Concepcion, Chile



Rodrigo Huillical, Roberto Aedo
Universidad de Bio Bio
Concepcion, Chile

Oscar Mahuzier
Instituto Geografico Militar, Chile

Pierre Lauber, Alexander Neidhardt
Technische Universität München
Fundamentalstation Wettzell
D-93444 Bad Kötzing, Germany

Hektohertz Upgrade



- New Laser and Eventtimer installed in March 2006
- DPSS Laser System
- SESAM modelocked
- New system capable to perform with 100Hz repetition rate

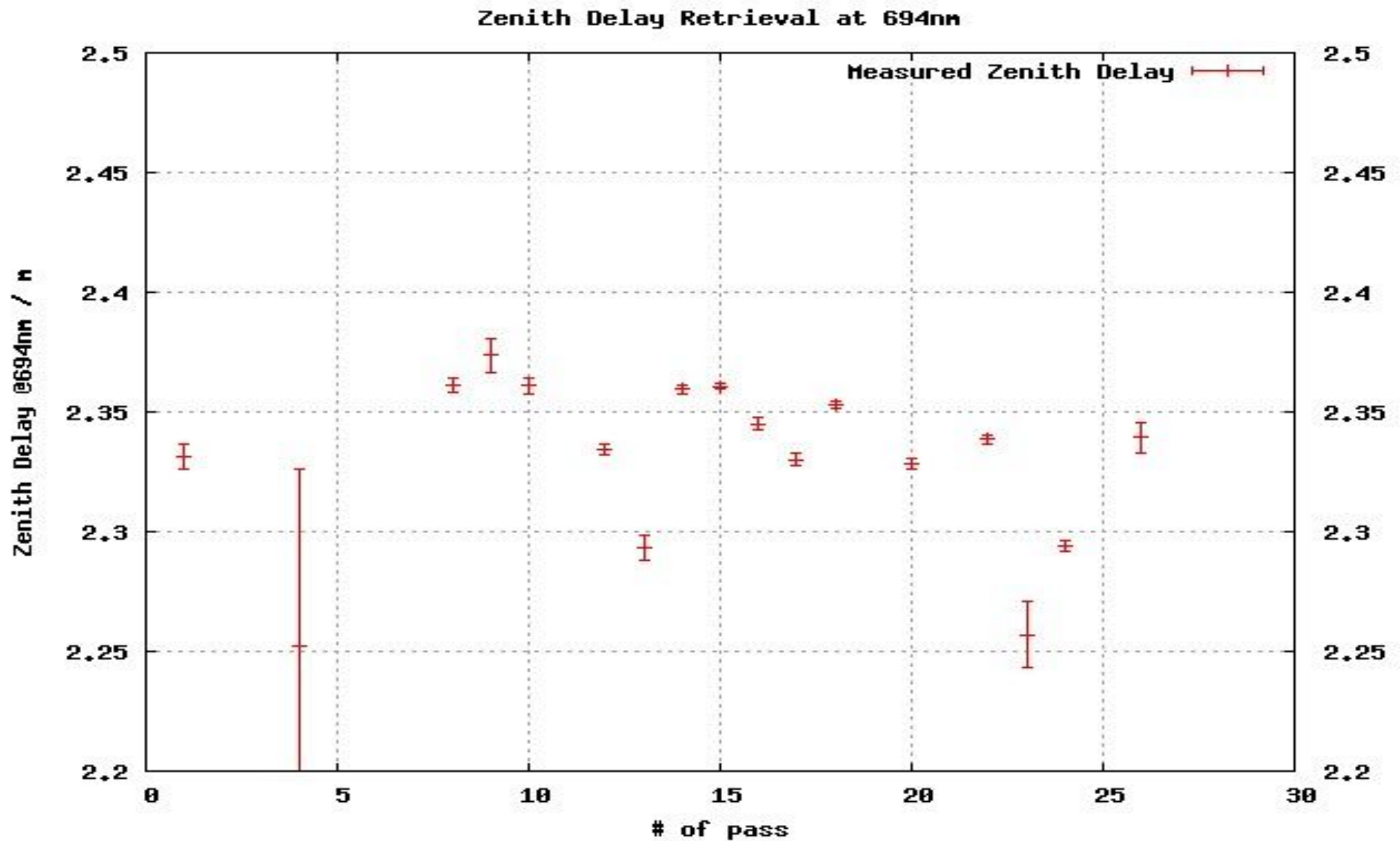
Zenith Delay Retrieval by Two Colour Measurement

- September 2006 Starlette Fullrate Data
- Simultaneous Regression of Orbit Parameters and Zenith Delay normalized to 694nm

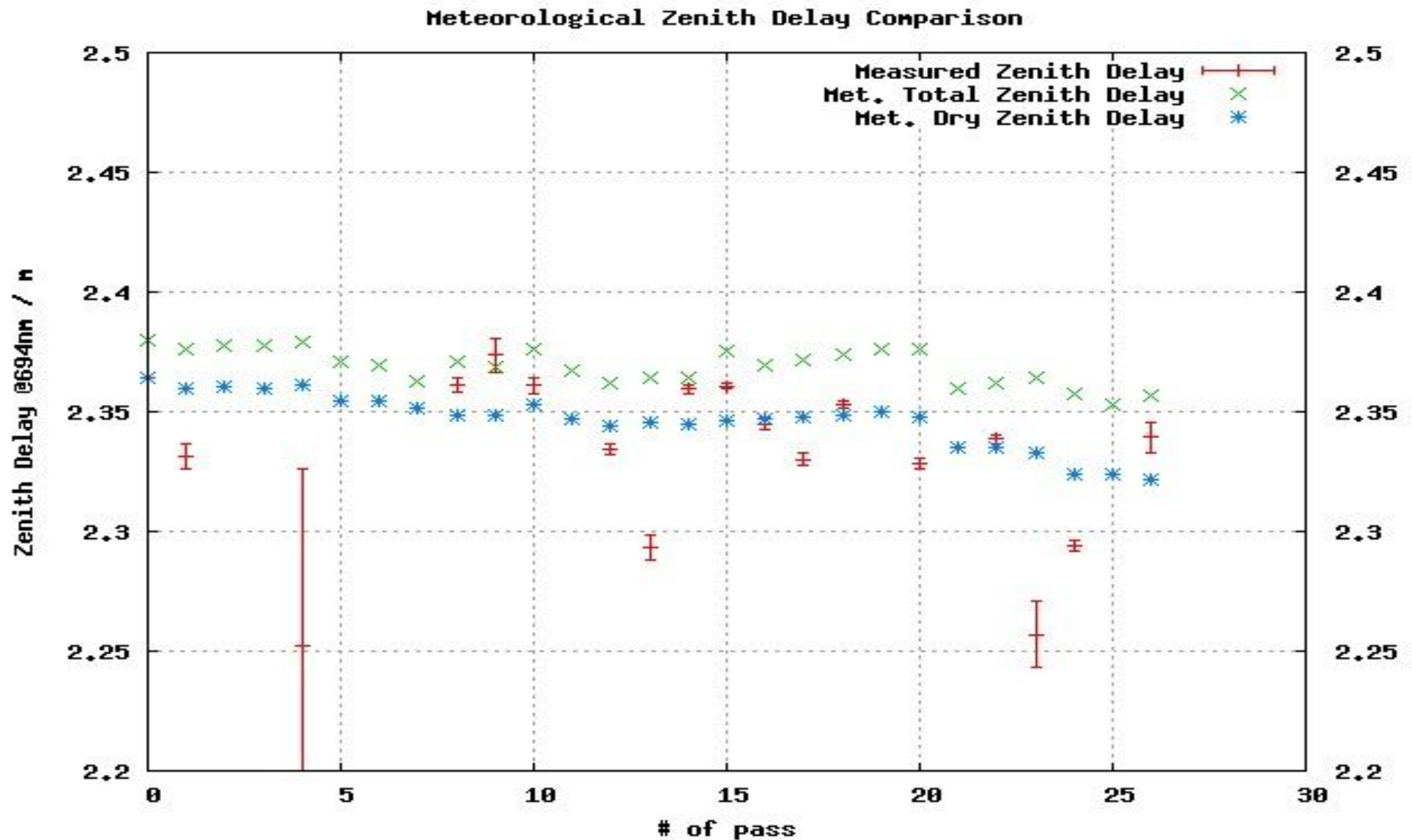
i.e. $Res(\lambda) = m(\theta) f(\lambda) ZD(\lambda = 694 \text{ nm}) + \text{Orbit Correction}$

- Mendes Mapping Function
- Single Station Data
- Unmodeled Errors absorbed by Orbit Parameters

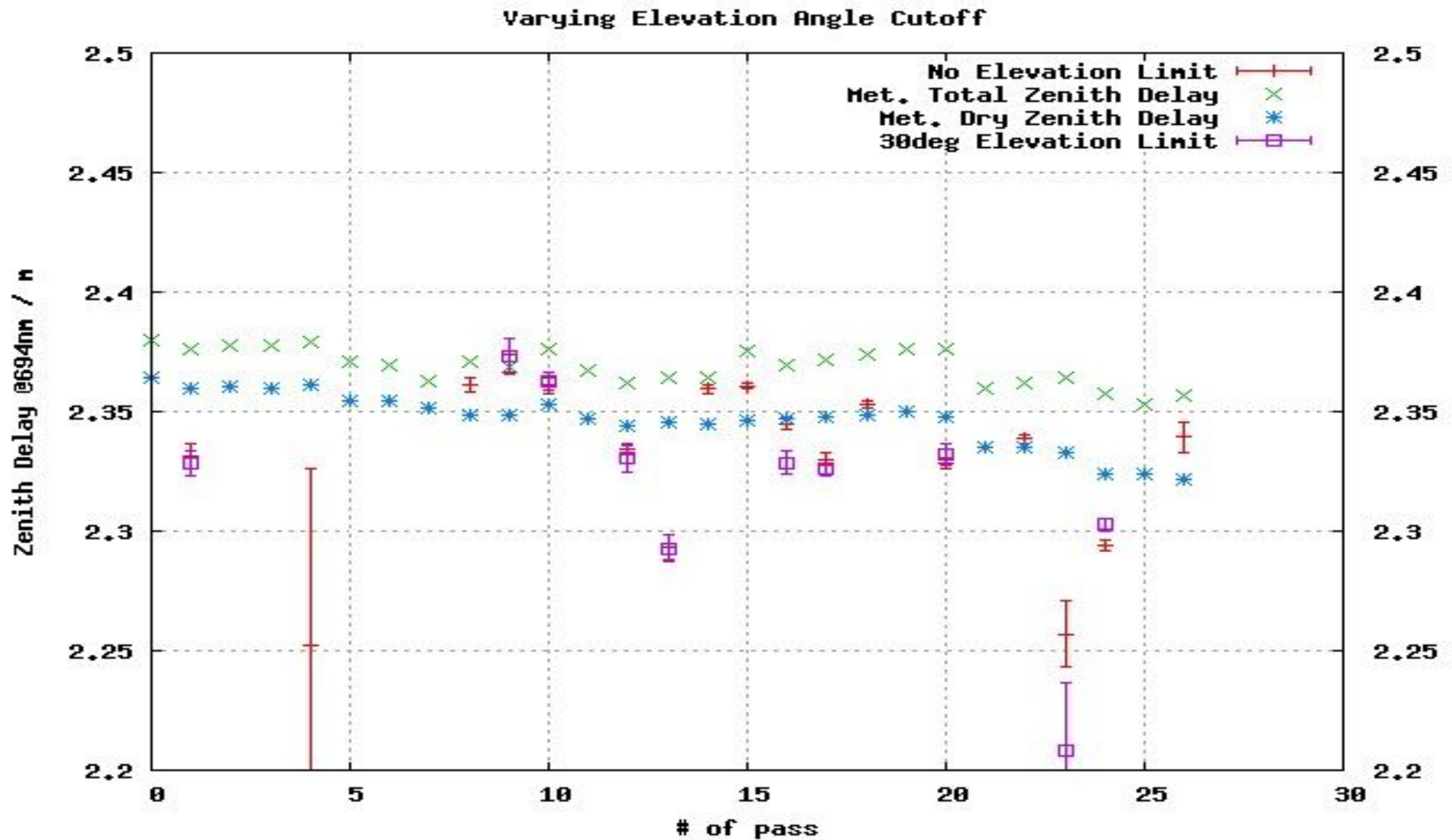
Zenith Delay Retrieval



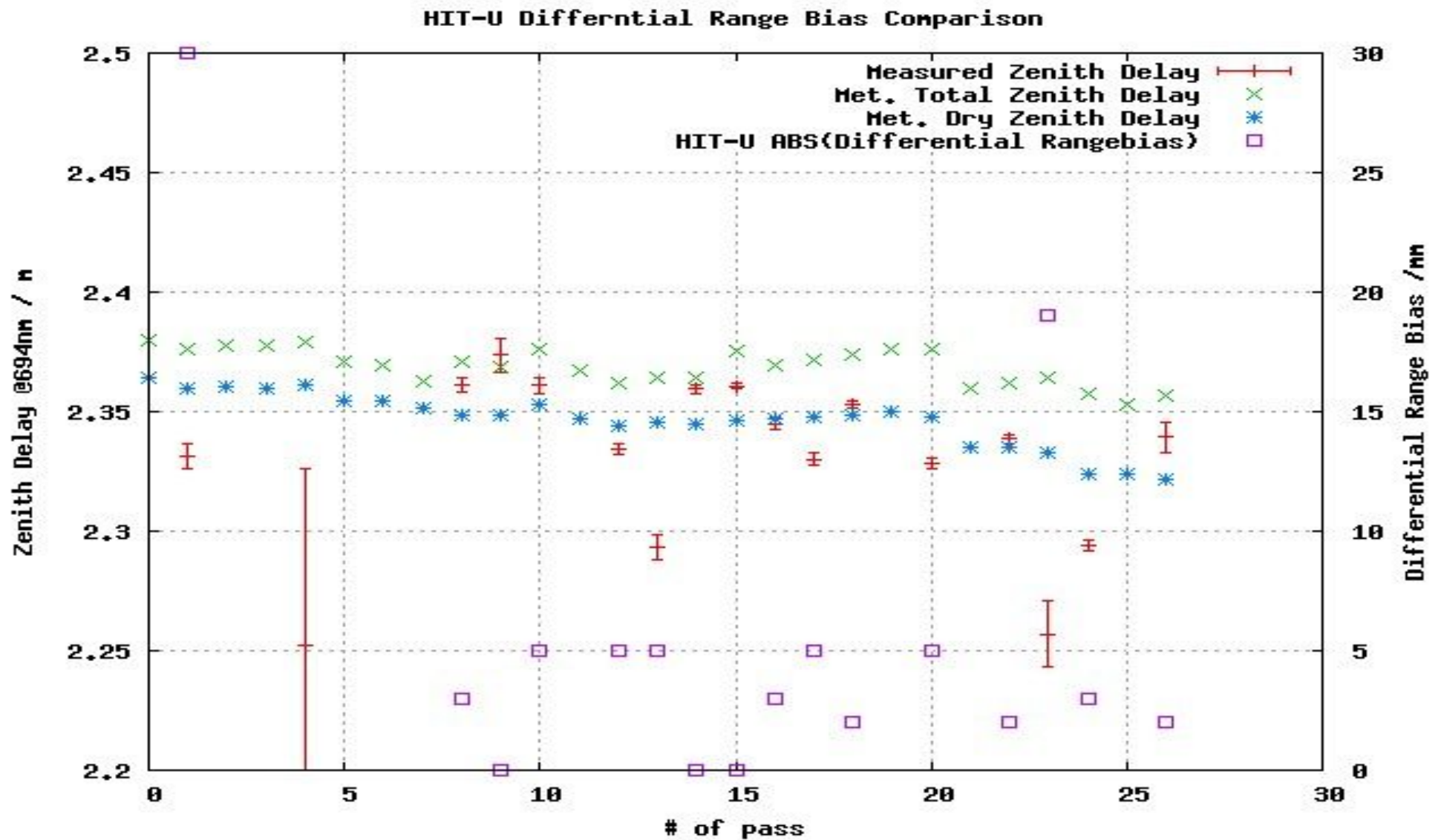
Meteorological Zenith Delay Comparison



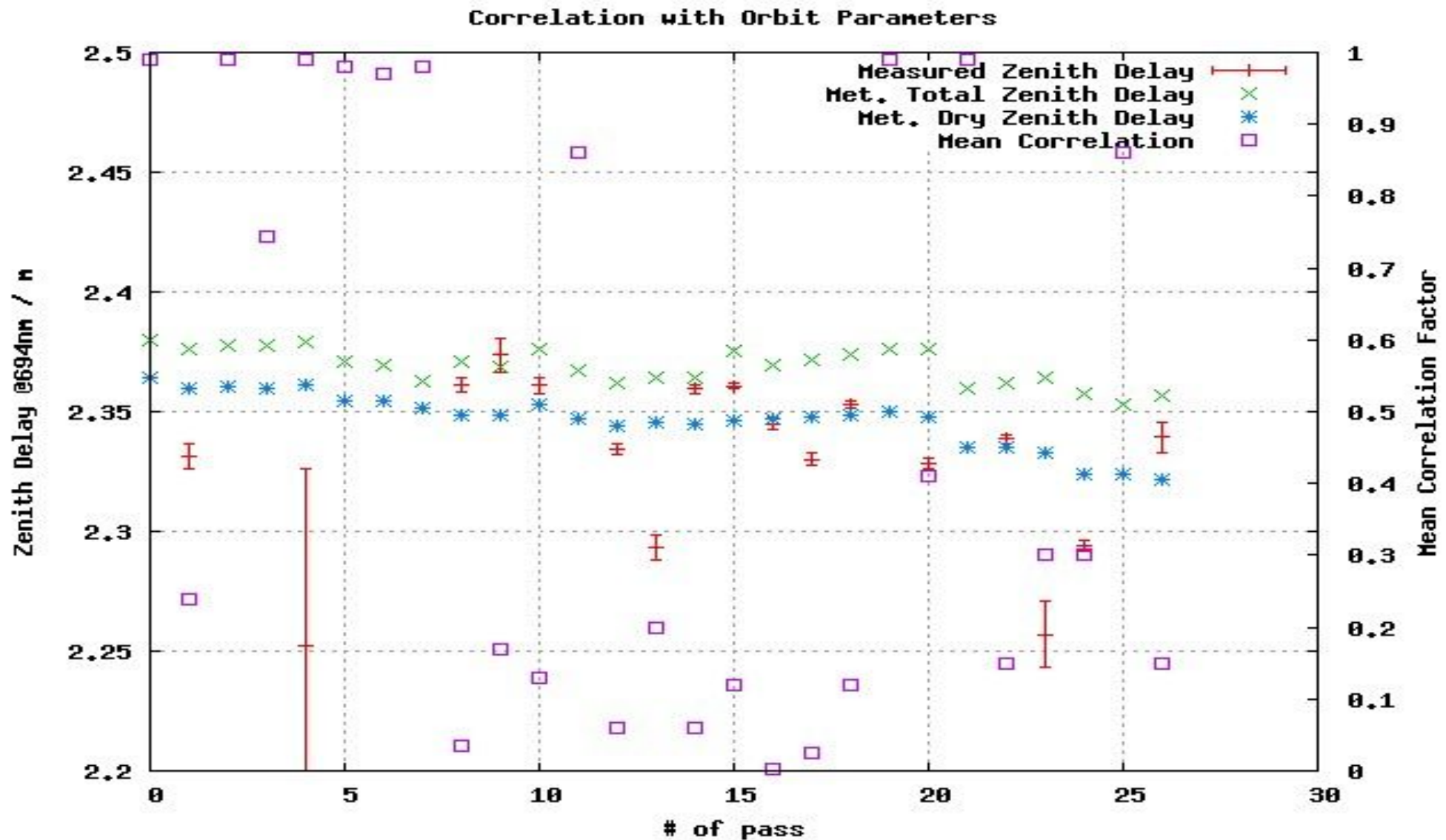
Varying Elevation Angle Cutoff



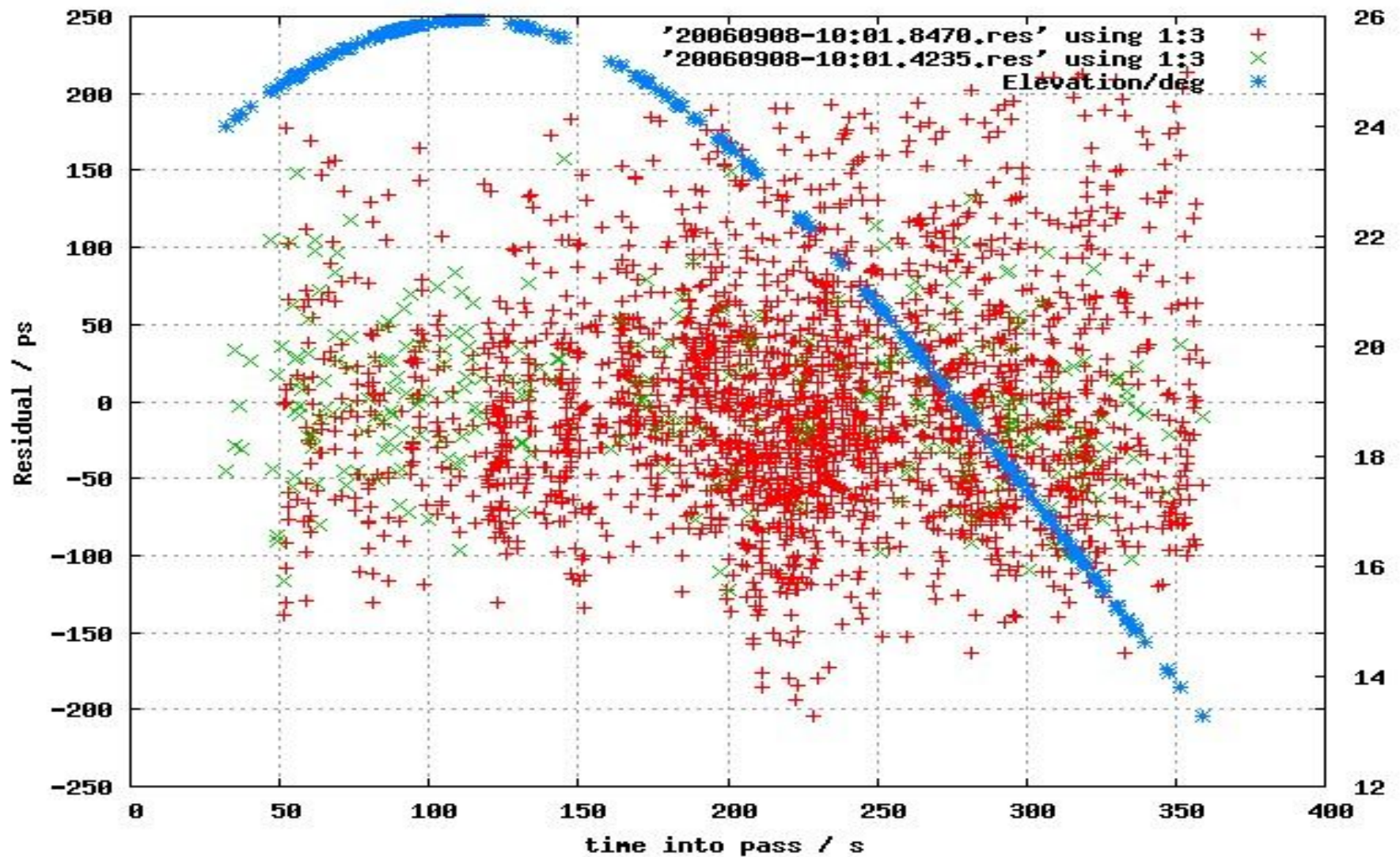
HIT-U Differential Range Bias Comparison



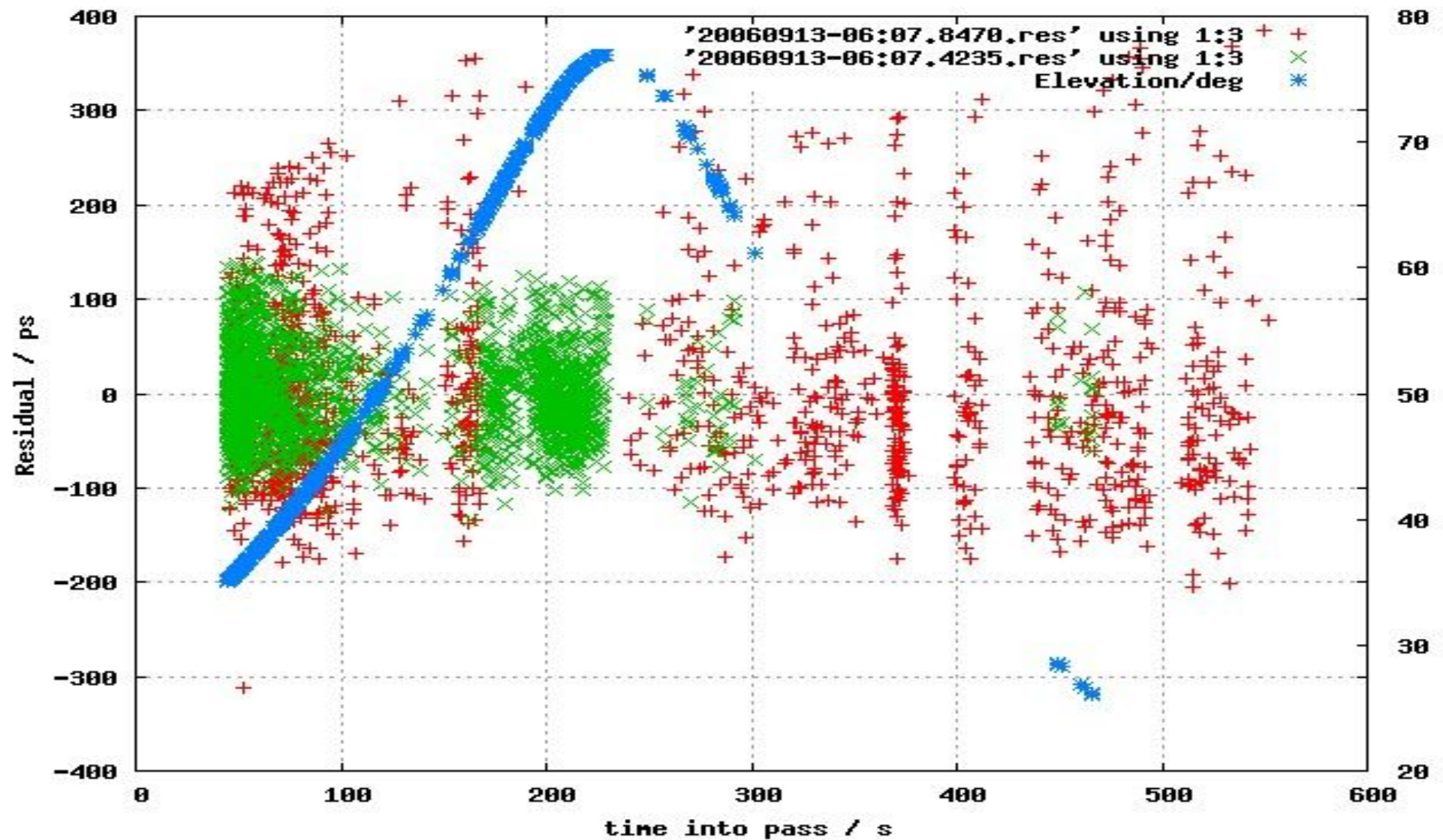
Correlation With Orbit Parameters



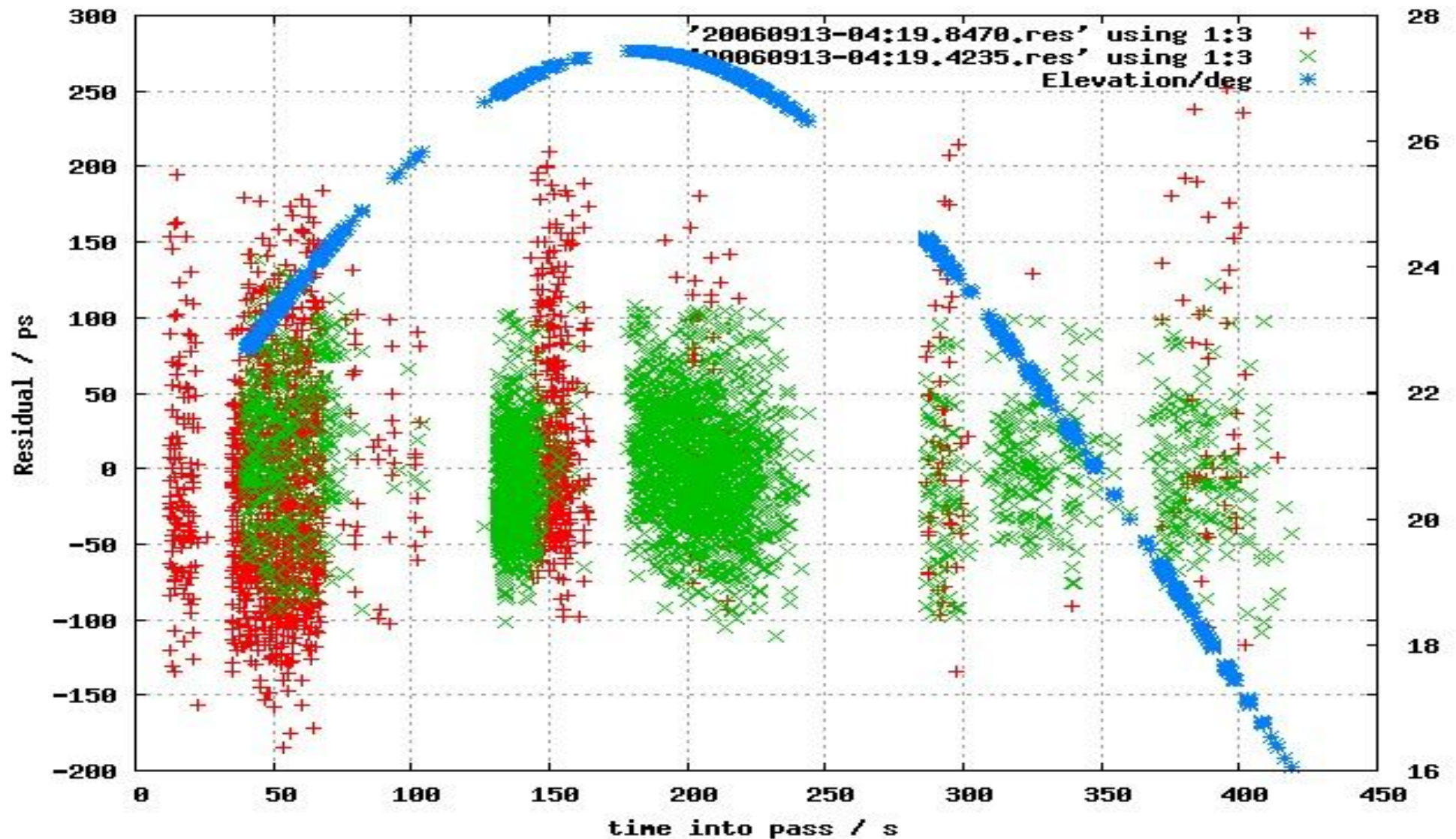
Passage #8



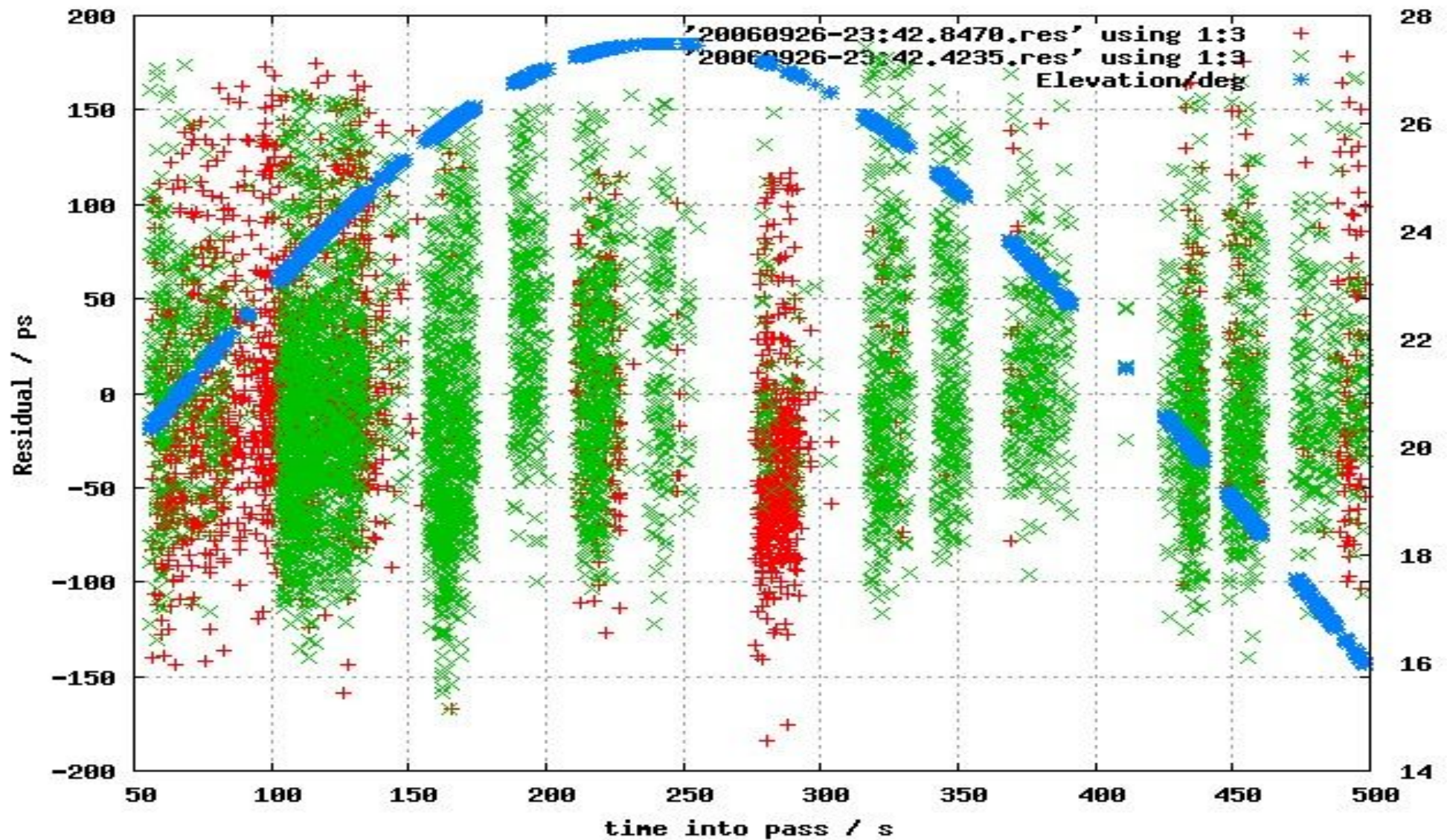
Pass #13



Pass #14



Pass #15



Conclusion

- Hektohertz Two Colour Ranging yields Millimeter Precision Zenith Delay
- Effectively Decreases Correlation with Orbit Parameters
- Mostly independent from Elevation Angle Cutoff
- Zero Differential Range Bias Possible but hard to maintain
- Deviations from Zenith Delay Predicted by meteorological Data