

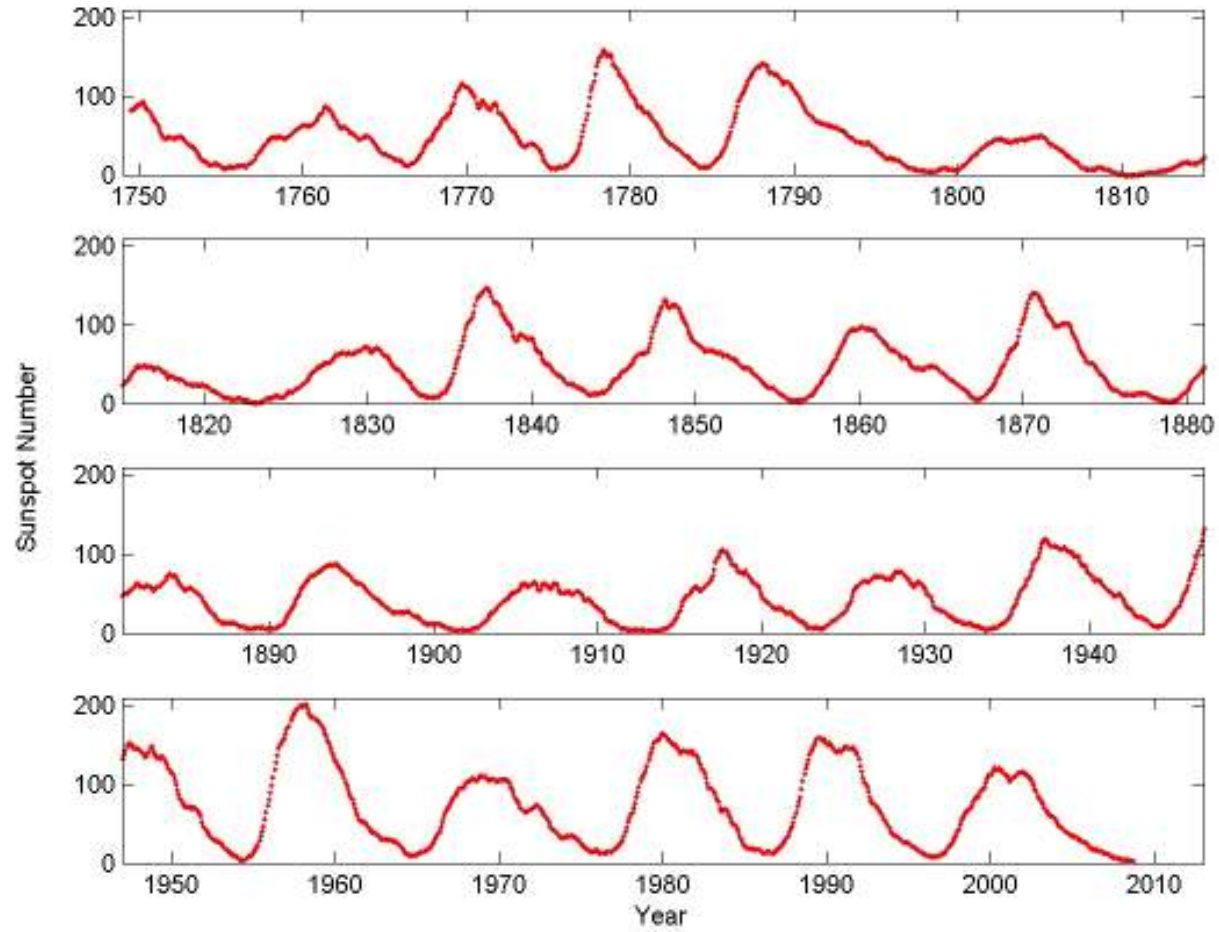
Measurements with Network-RTK: The effect of electron density variability in the ionosphere

J. Johansson, R. Emardson, P. Jarlemark, M. Lidberg, and B. Jonsson



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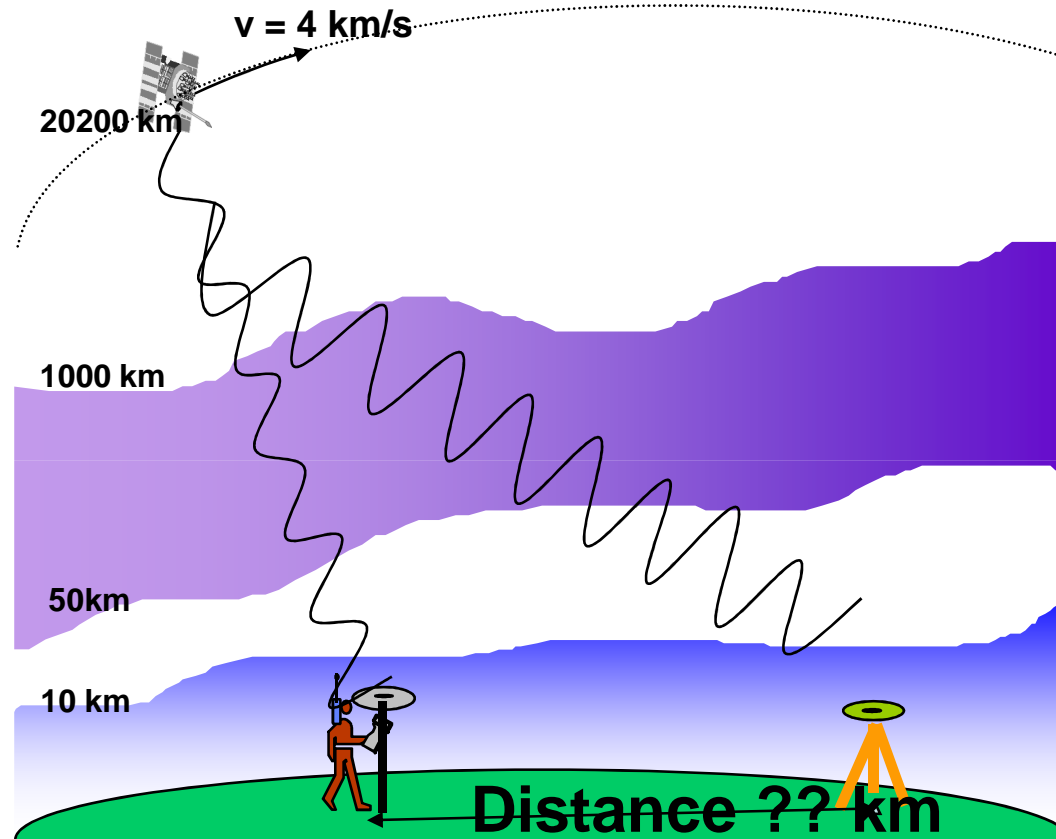
Solar Cycle



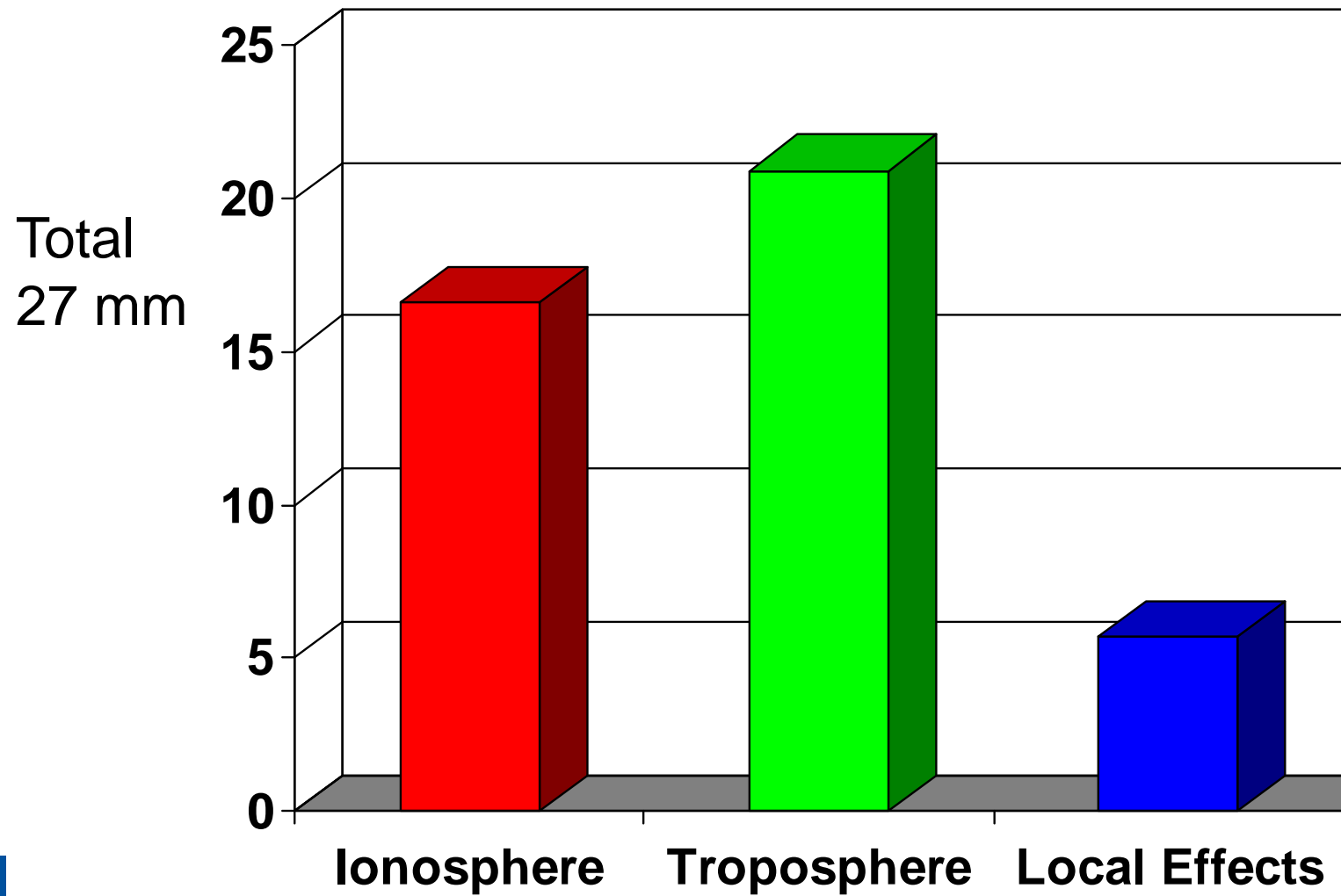
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Error Sources

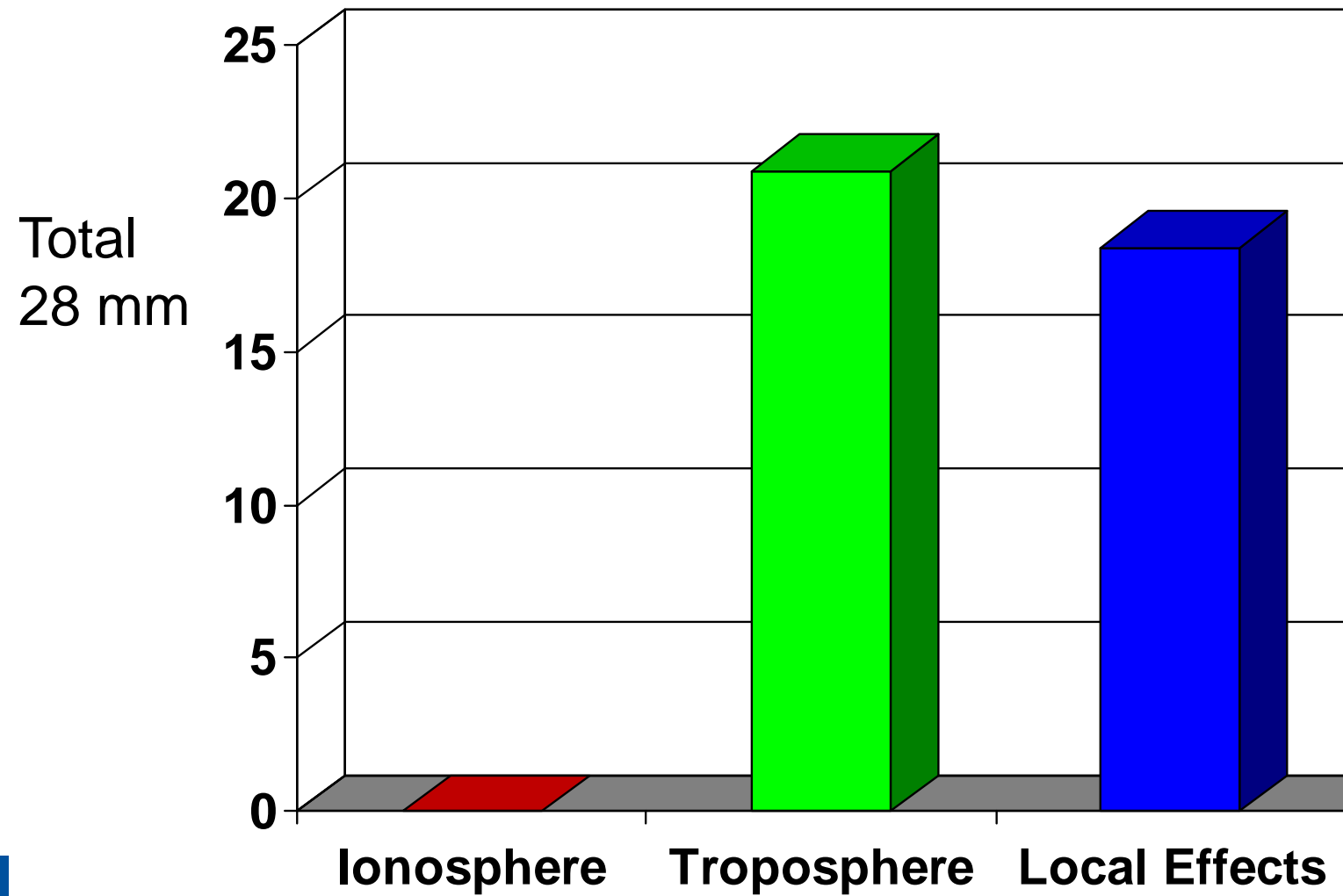
- Satellite clocks
- Satellite orbits
- Ionosphere
- Troposphere
- Local effects



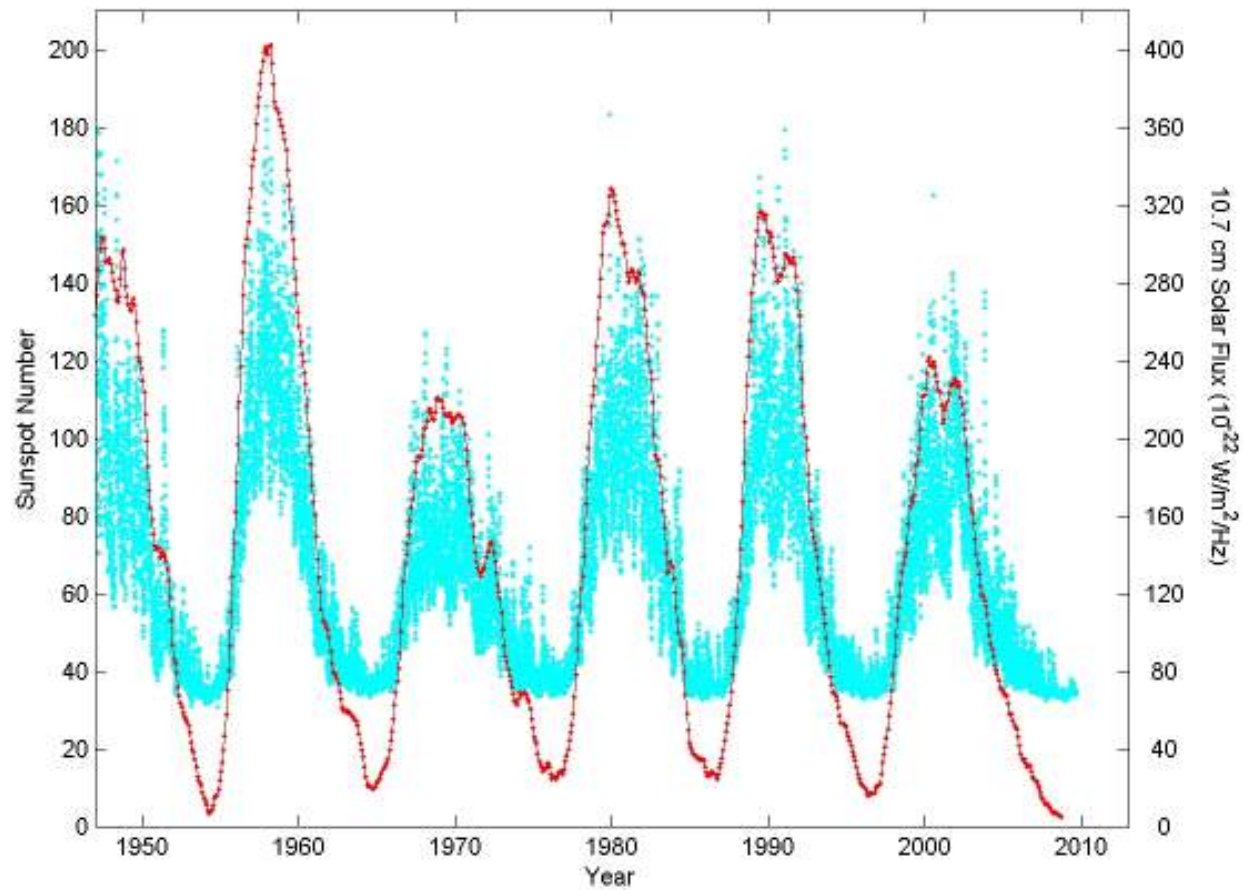
L1 - Processing



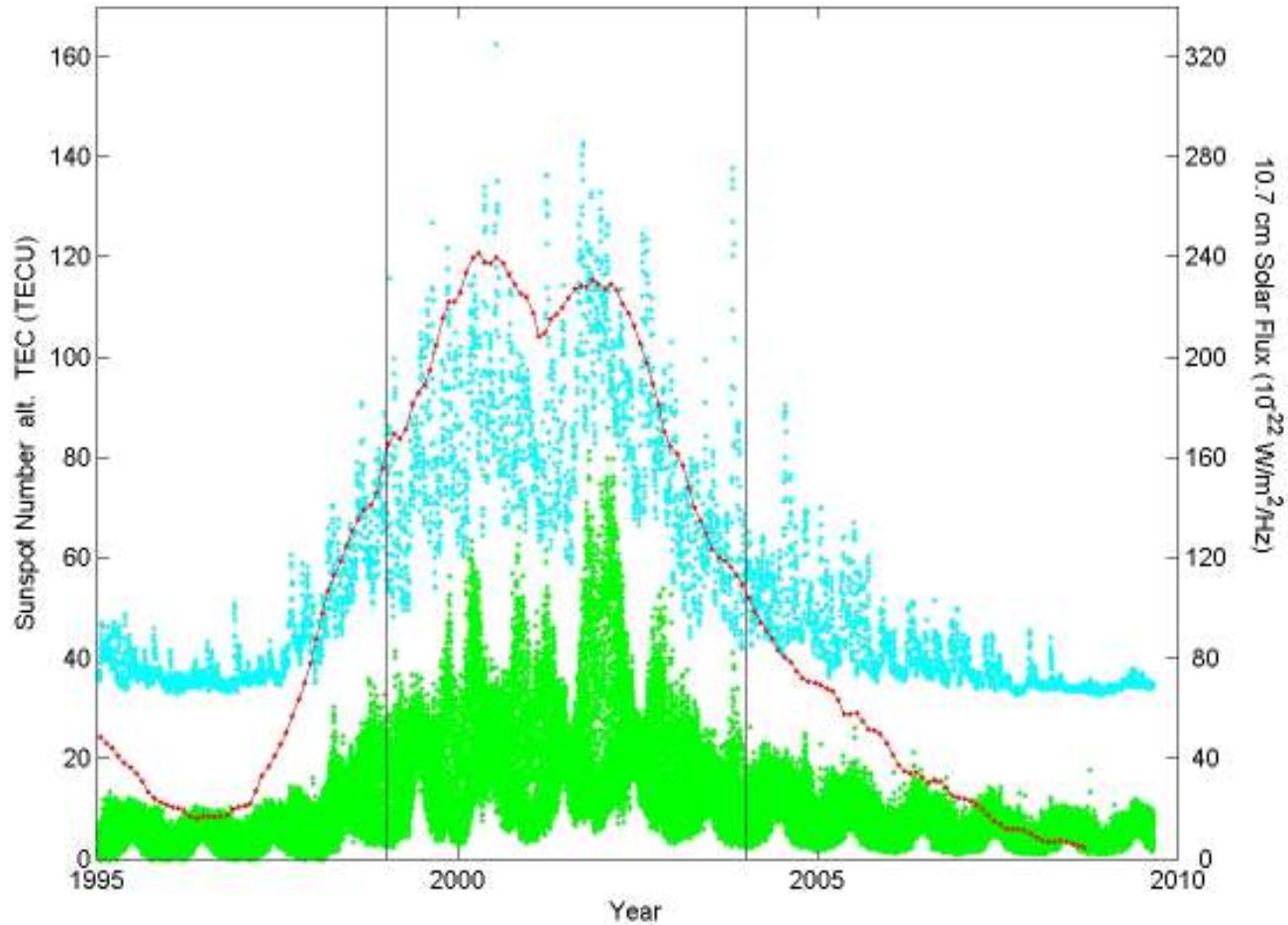
L3 - Processing



Measurements of solar activity

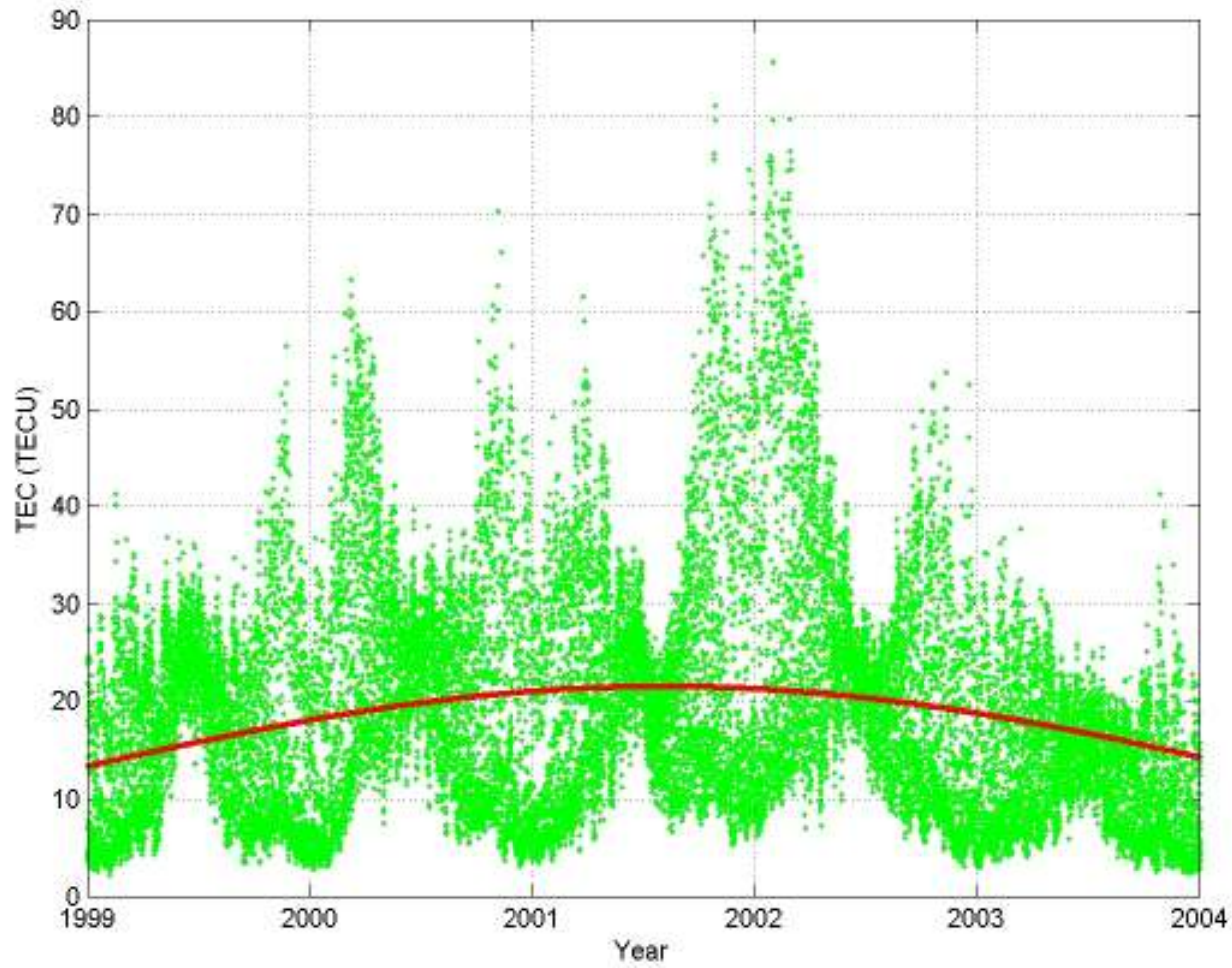


Previous Solar Cycle



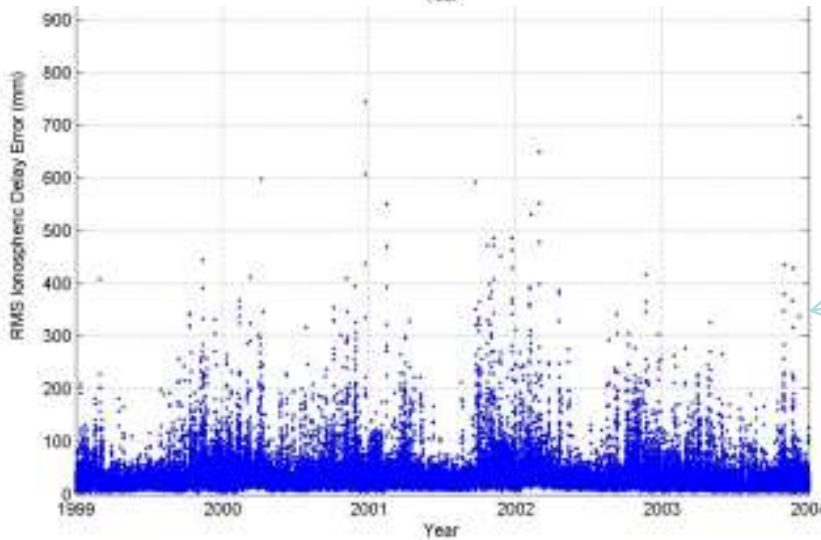
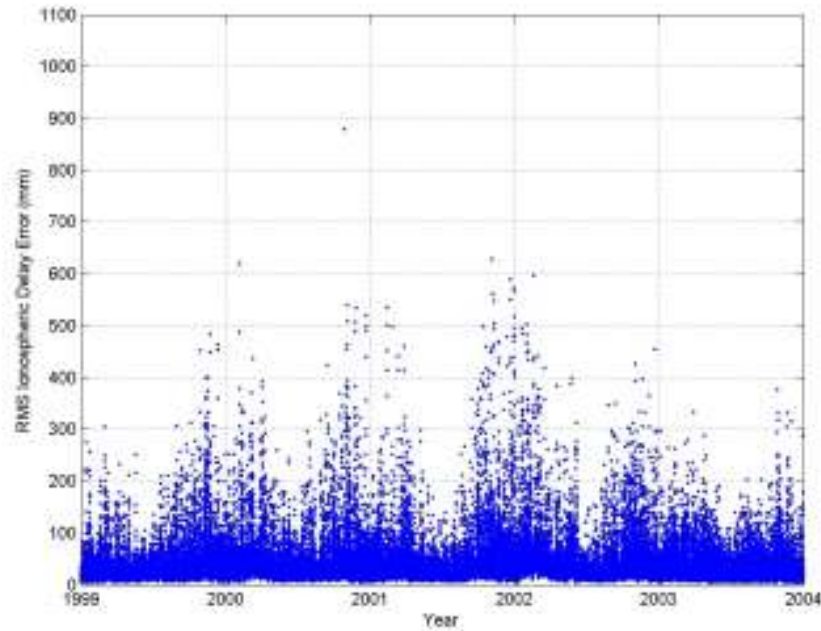
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5 Years



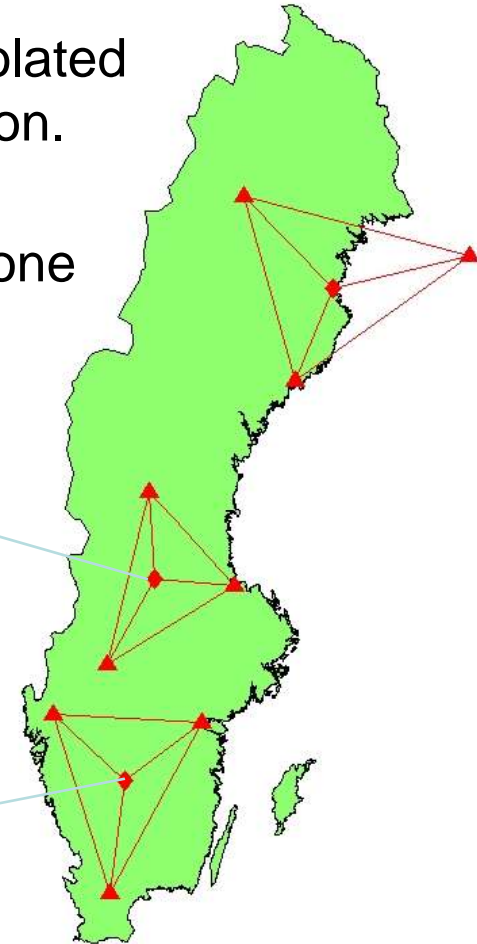
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Interpolation

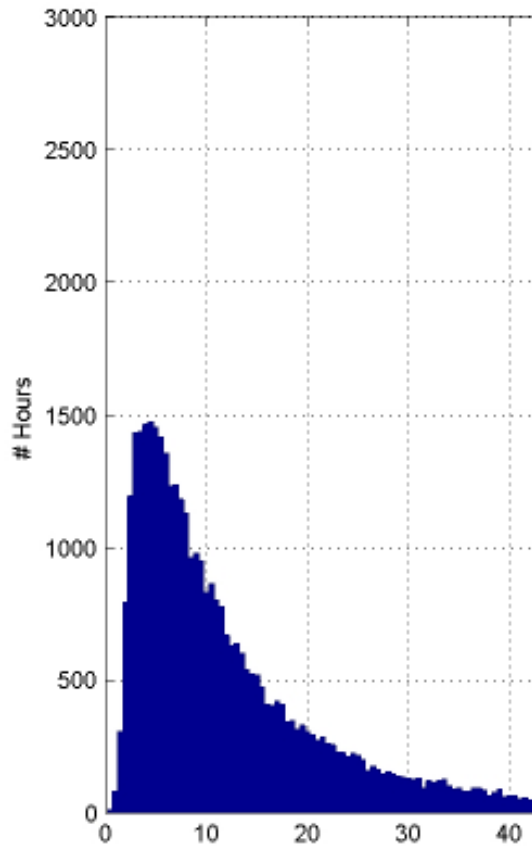


Error in interpolated zenith correction.

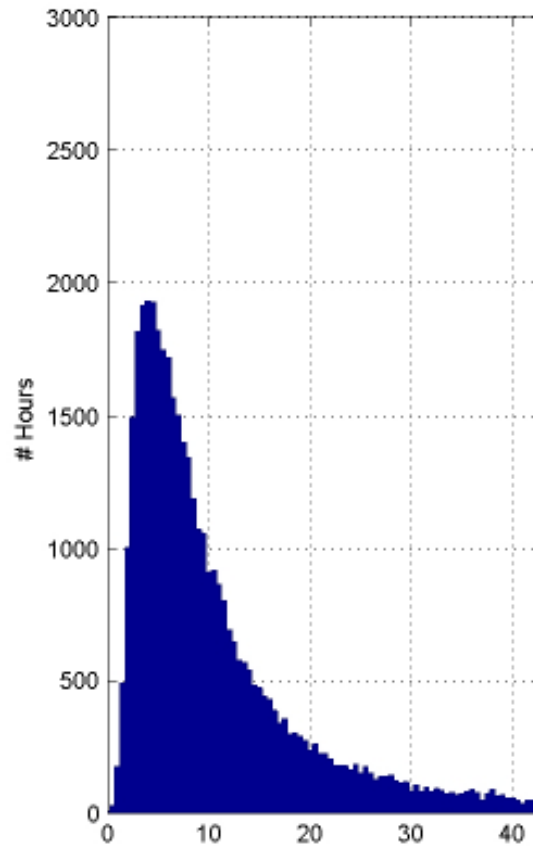
Graphs show one value per hour



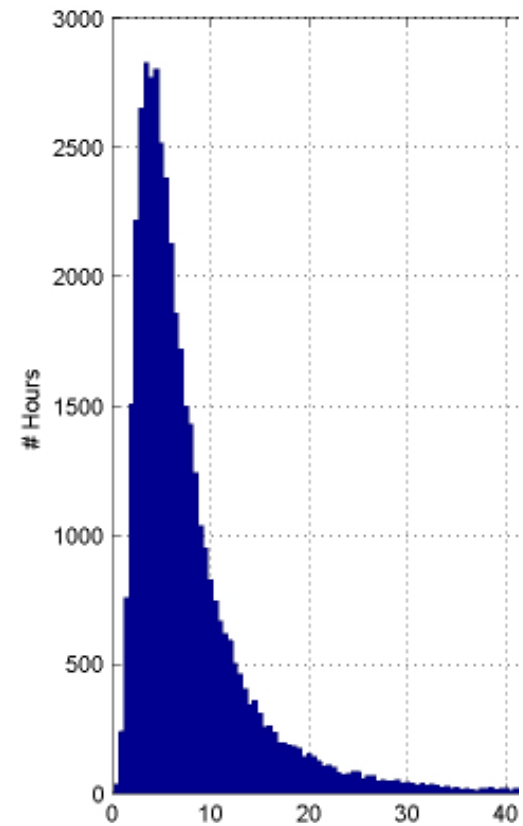
Distributions



North



Middle

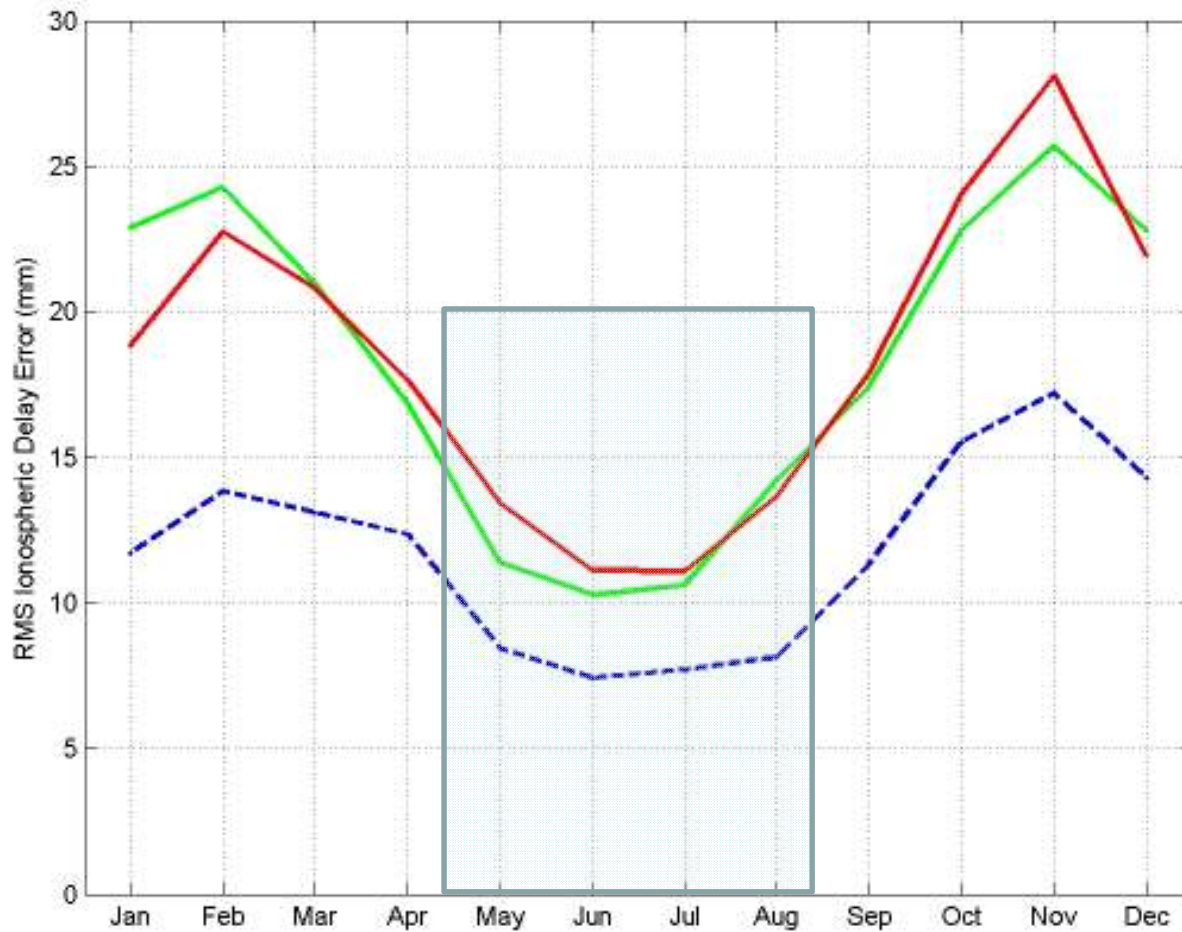


South

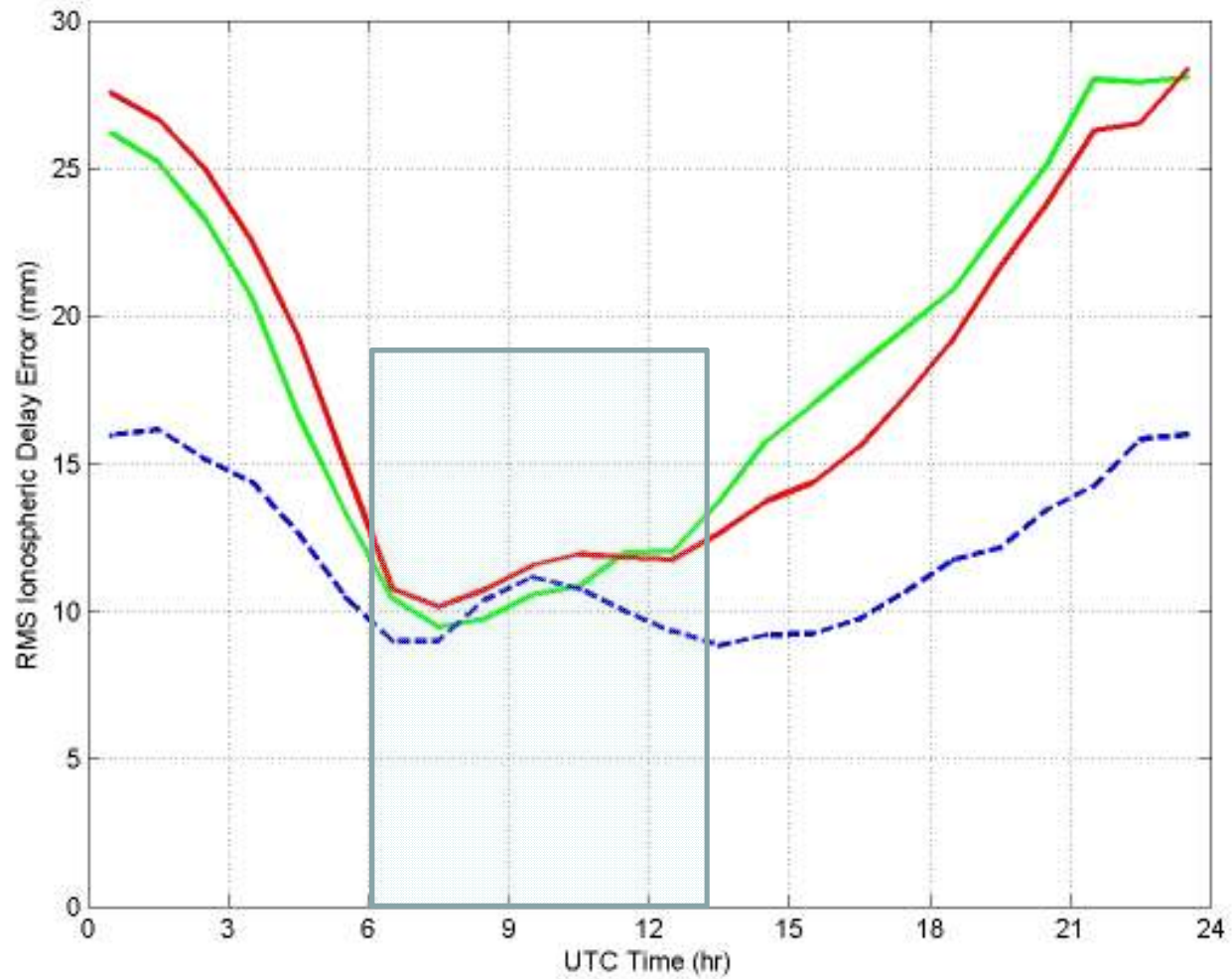


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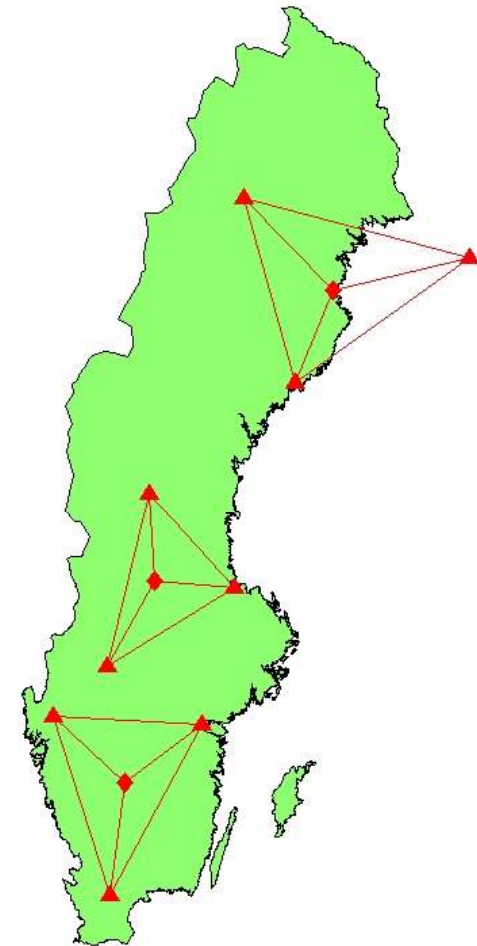
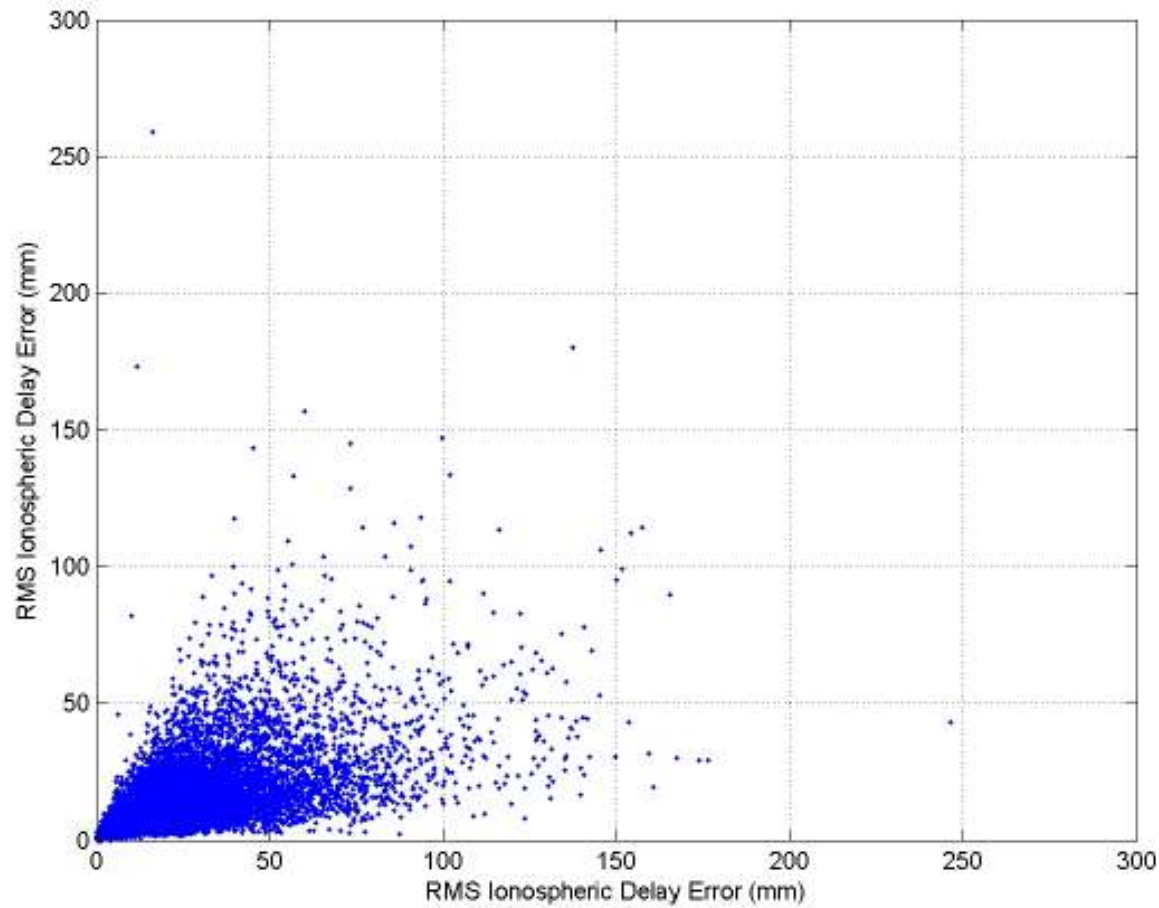
Variations during the year



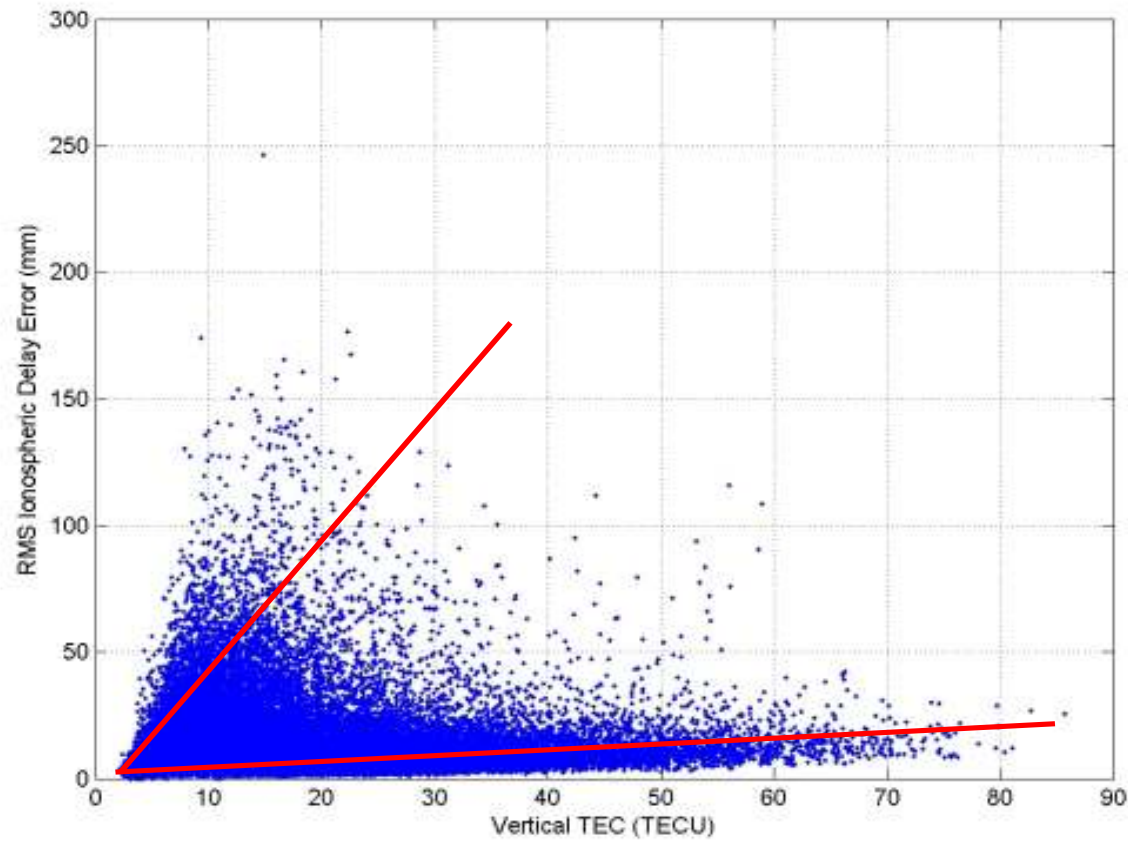
Variations during the day



Spatial Variations

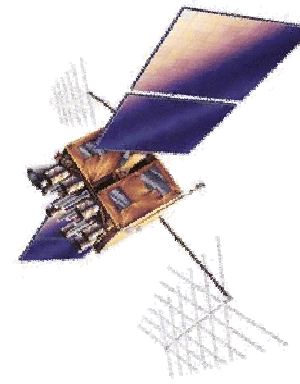
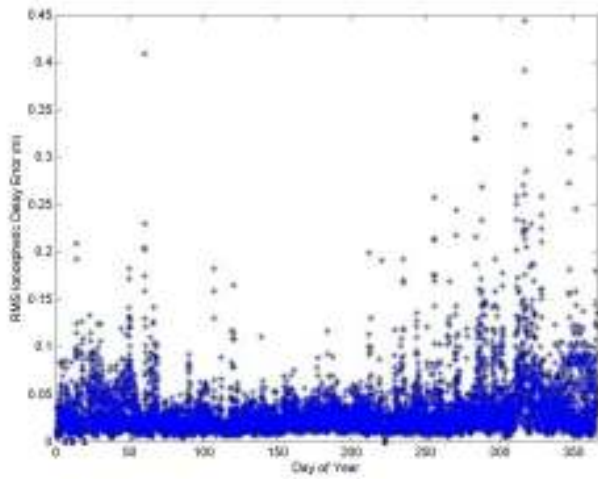


Correlation with TEC



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Simulations



Rover



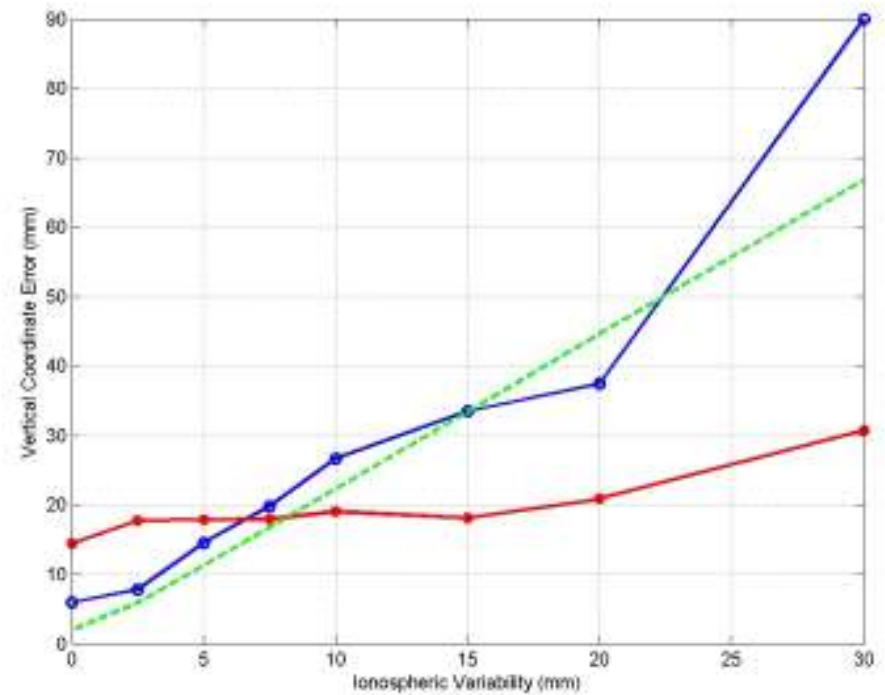
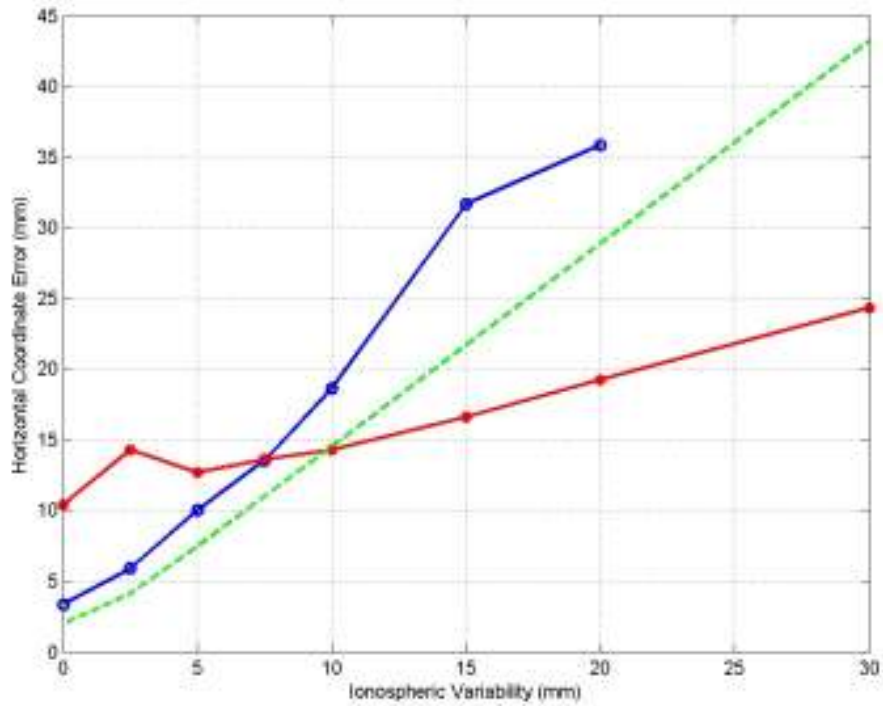
Reference



Modell corrections

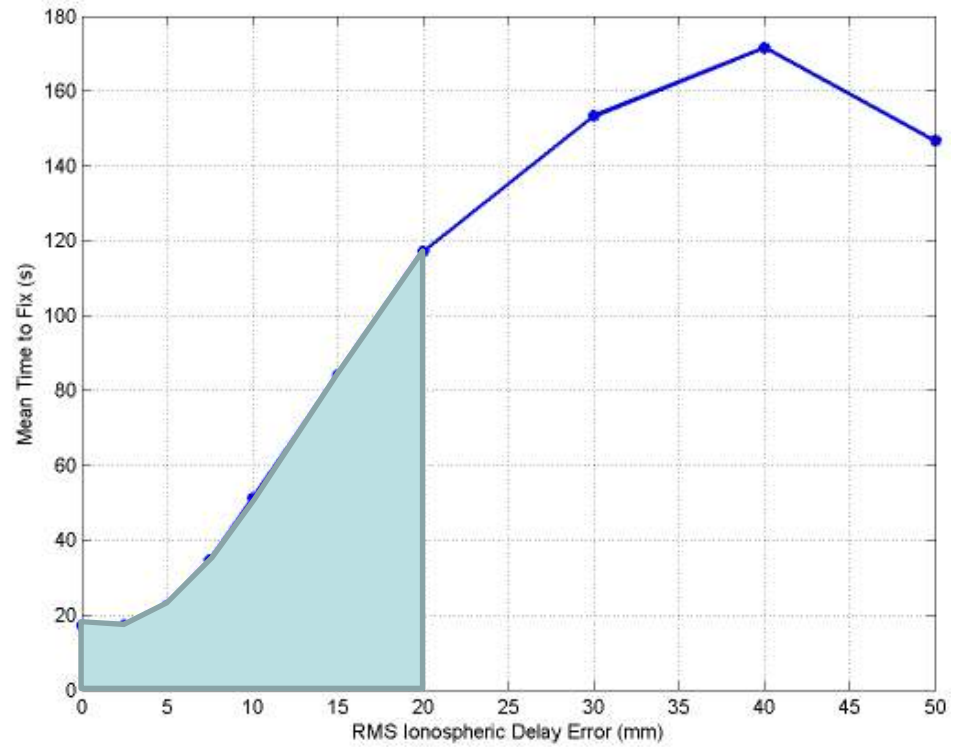
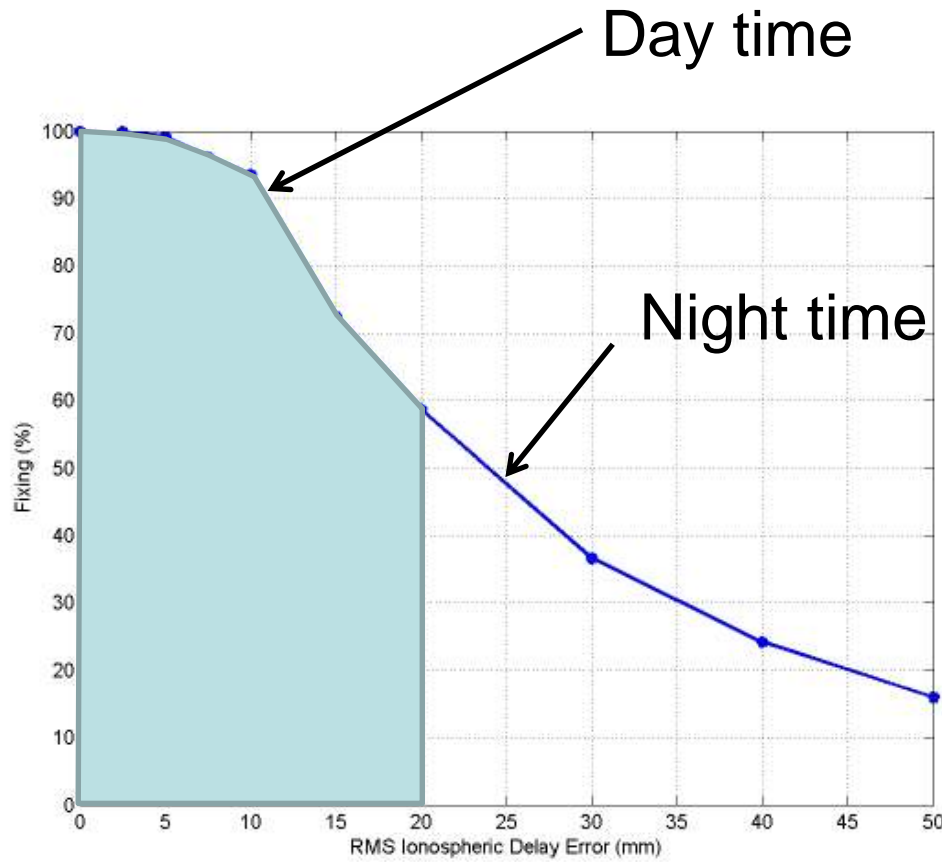


Javad



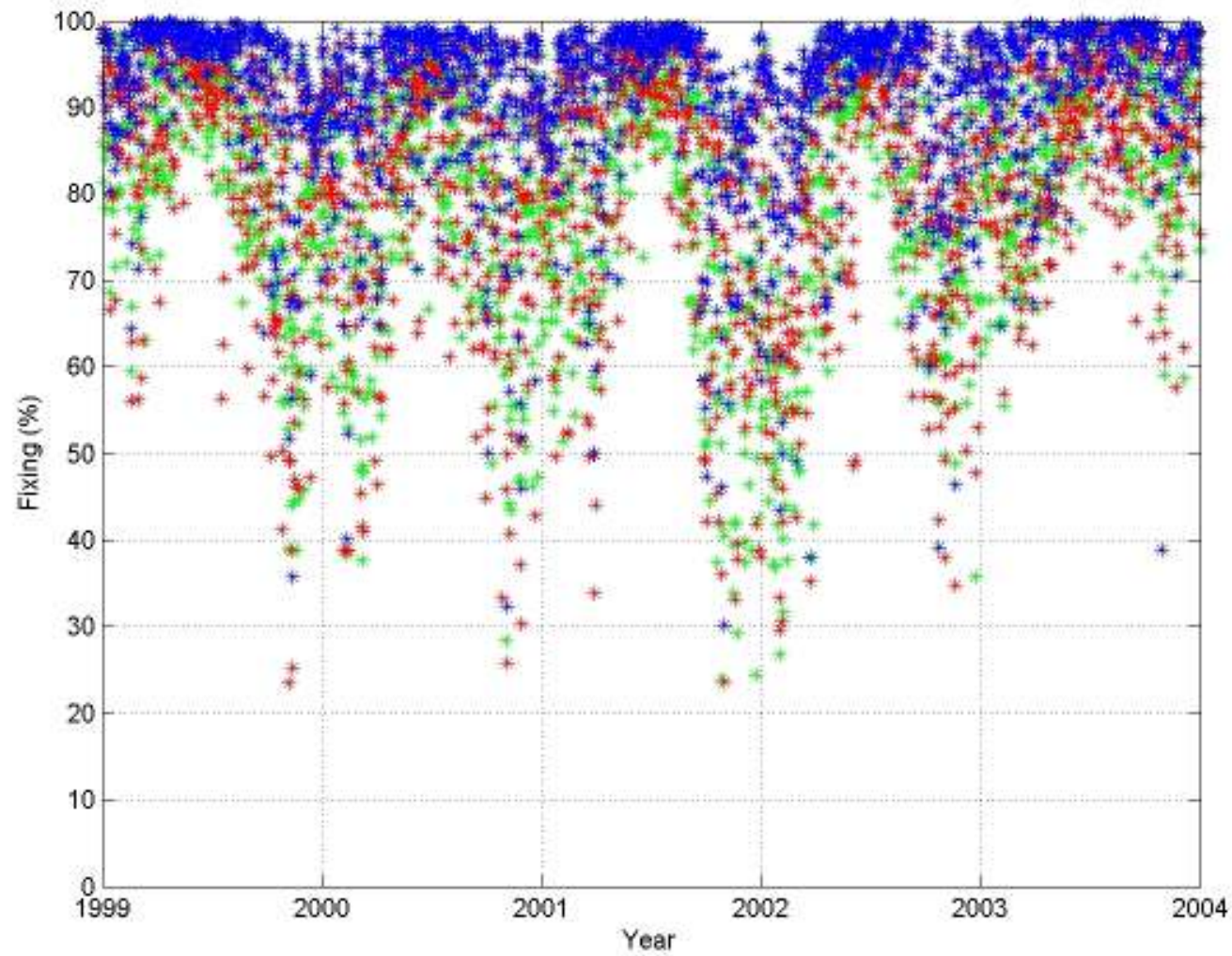
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Javad – RTCM2



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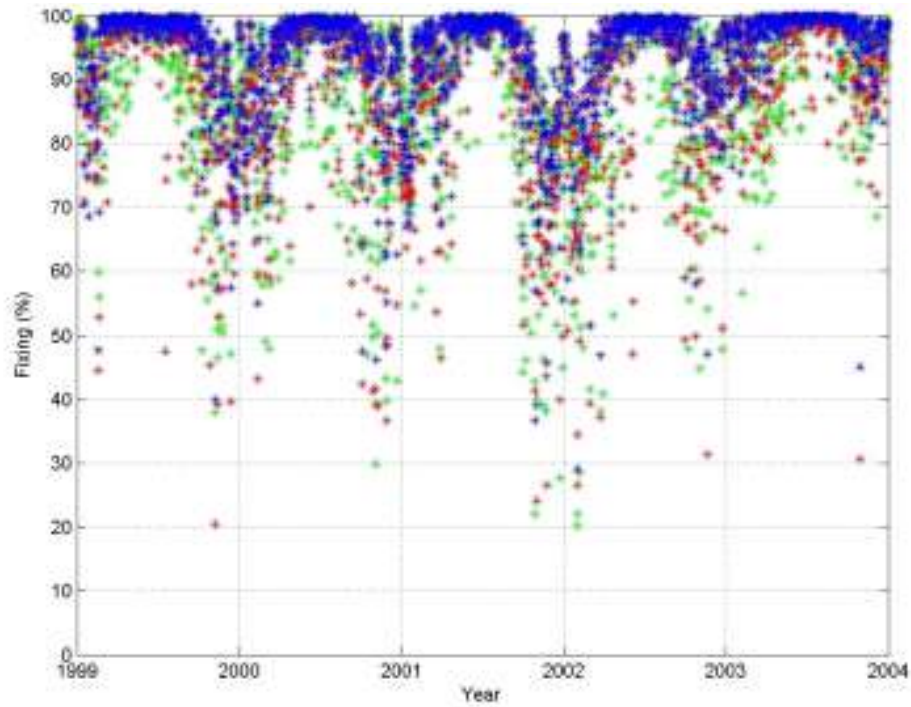
Probability for fix



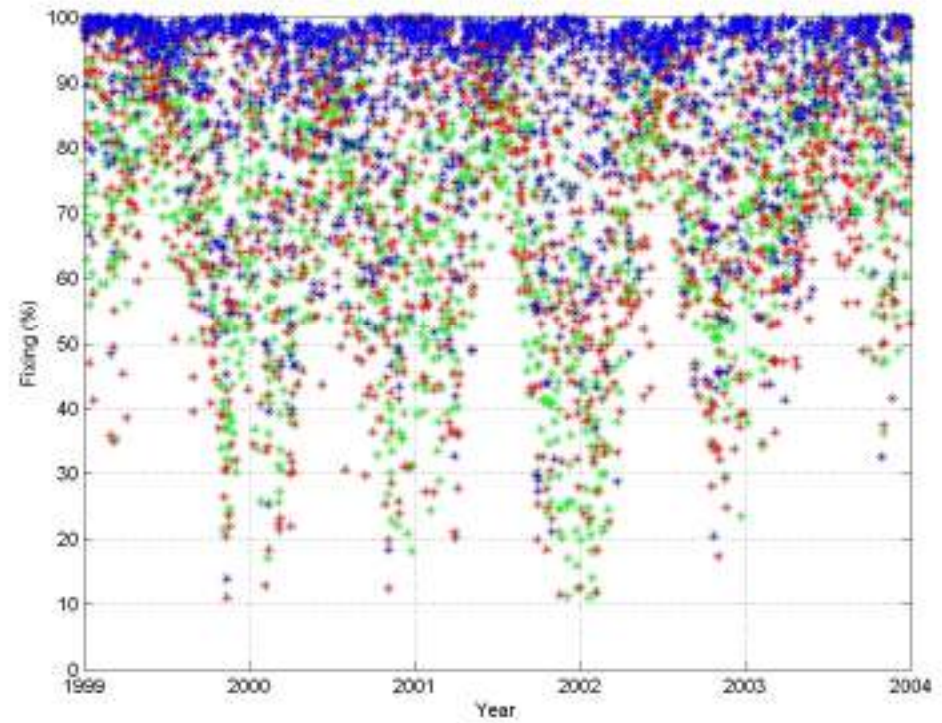
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Probability for fix

Day



Night



Summary

- Spatial variations of the electron density in the ionosphere can complicate ambiguity fixing.
- The probability of finding a real fix solution using RTK measurements during the next solar maximum is about 85%. The mean time to find a correct combination is 55 seconds.
- Spatial variations of the electron density in the ionosphere reduce the performance of the network RTK.
- The use of the L3 combination removes this error source at the expense of the local effects.

