Session 3: InSAR data

InSAR time series analysis techniques overview

(+ some signal-related comments)

SCEC Community Geodetic Model (CGM) workshop

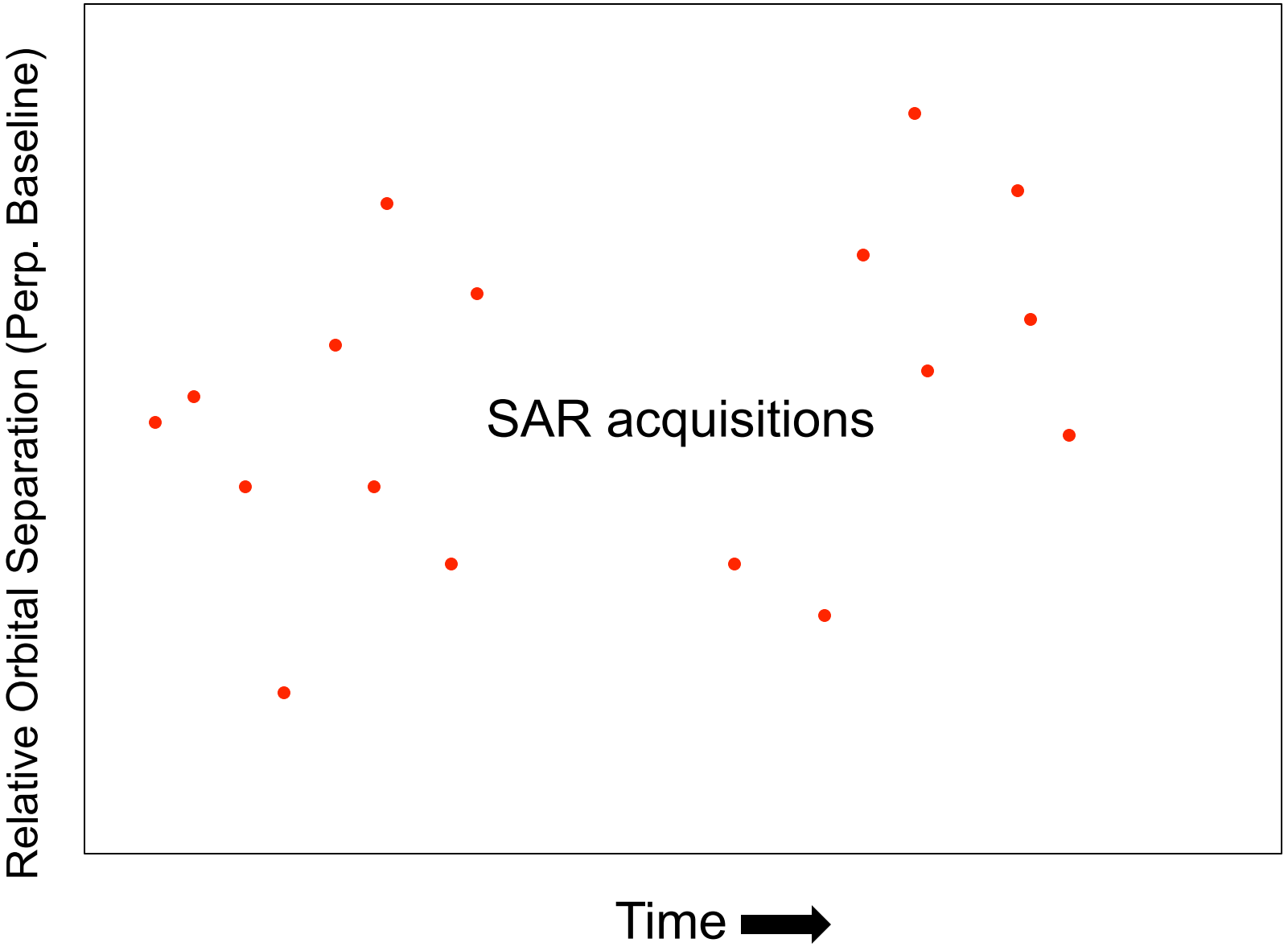
May 30-31

Menlo Park, CA

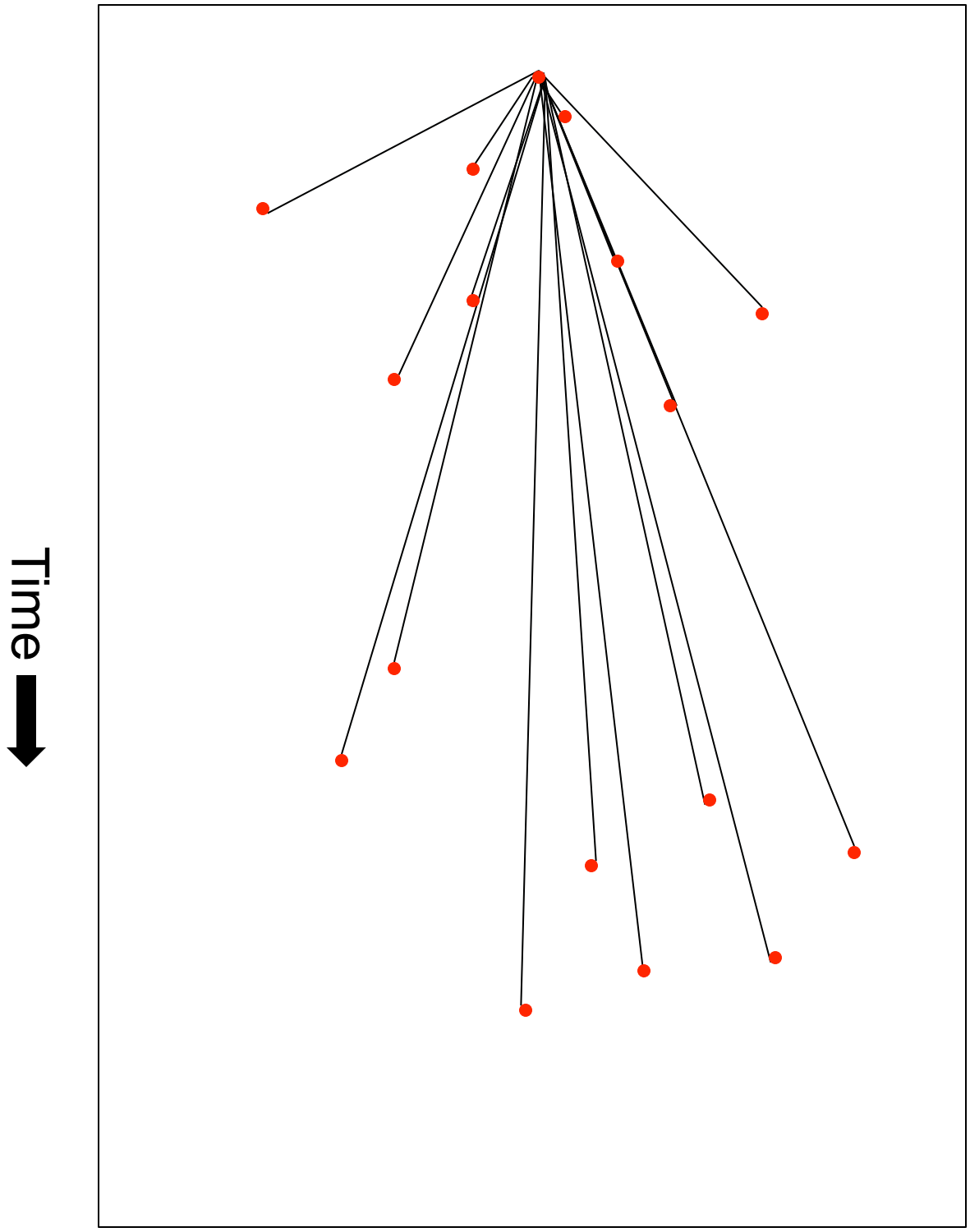
InSAR time series analysis

- Given: series of 10's to 100's of SAR images
  - Nonuniform temporal spacing
  - Not all combinable

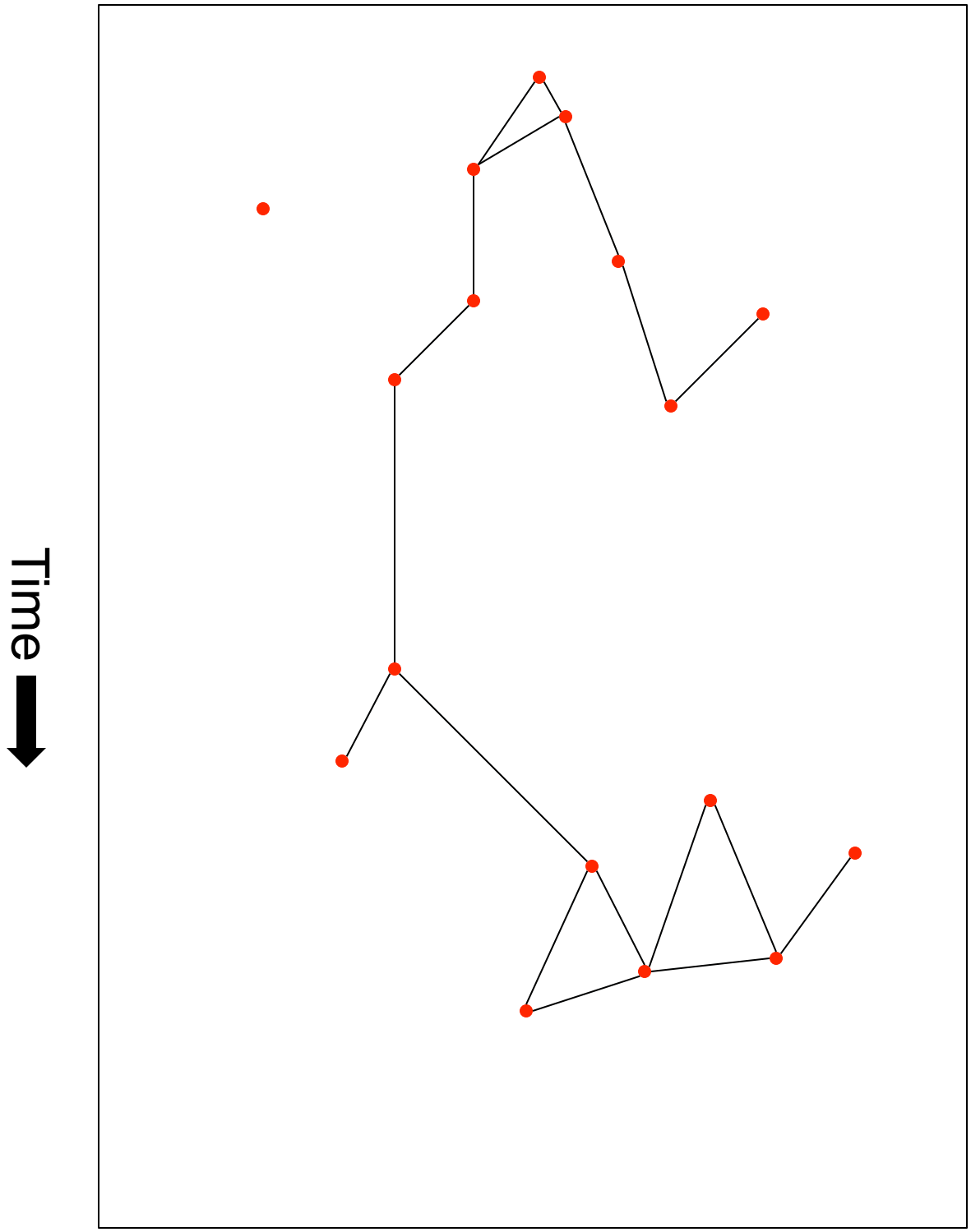
- Goals:
  - History of signal at each point
  - Inference of ground deformation
    - Secular, time-varying signals


Relative Orbital Separation (Perp. Baseline)
SAR acquisitions
Time

Relative Orbital Separation (Perp. Baseline)

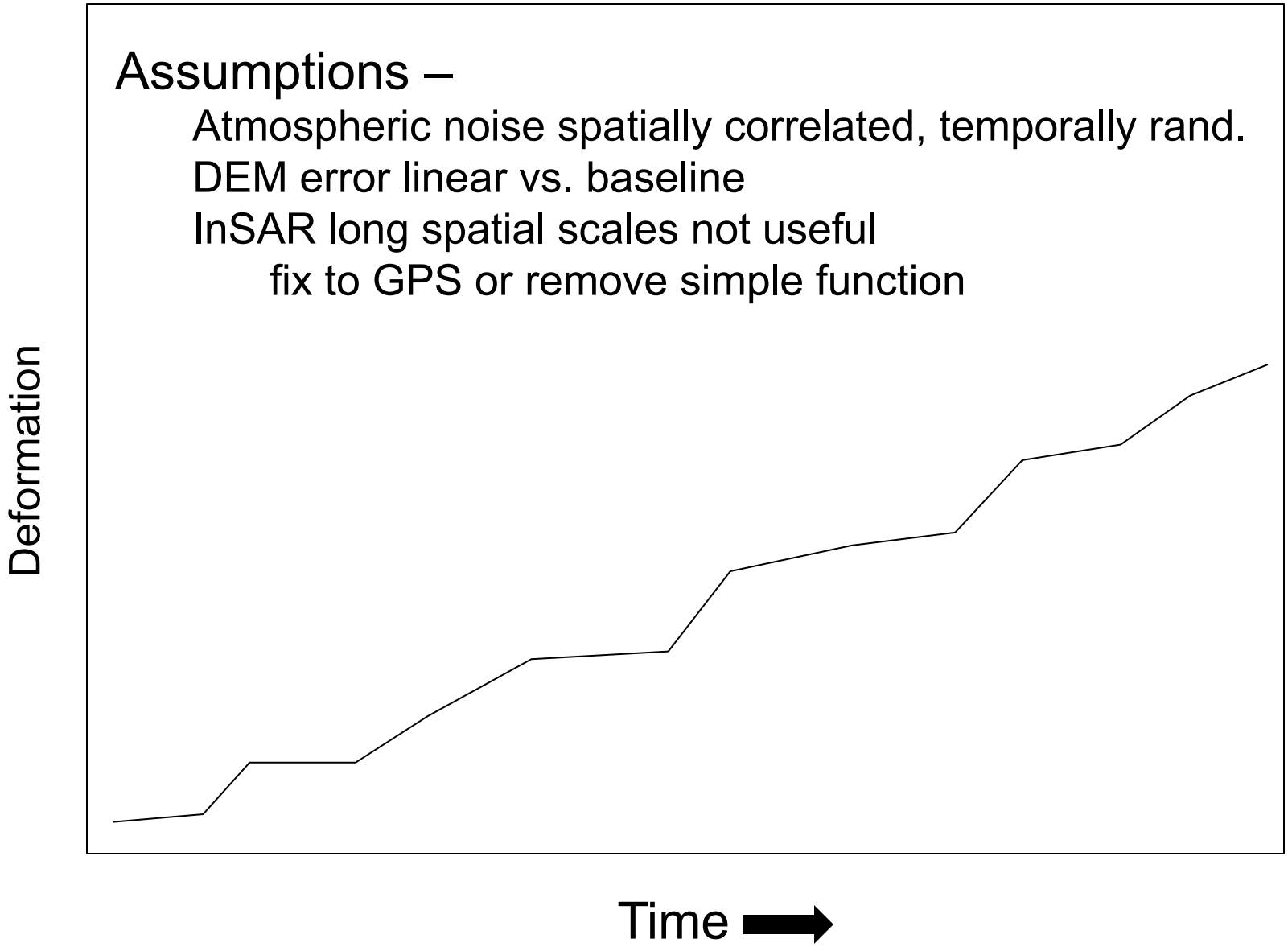


Relative Orbital Separation (Perp. Baseline)



Assumptions –

- Atmospheric noise spatially correlated, temporally rand.
- DEM error linear vs. baseline
- InSAR long spatial scales not useful
  - fix to GPS or remove simple function

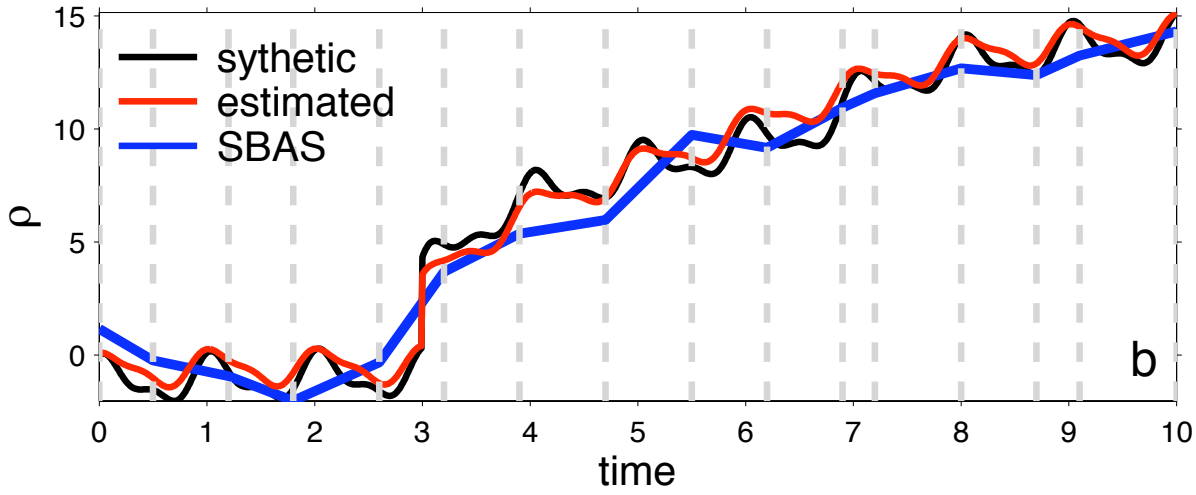


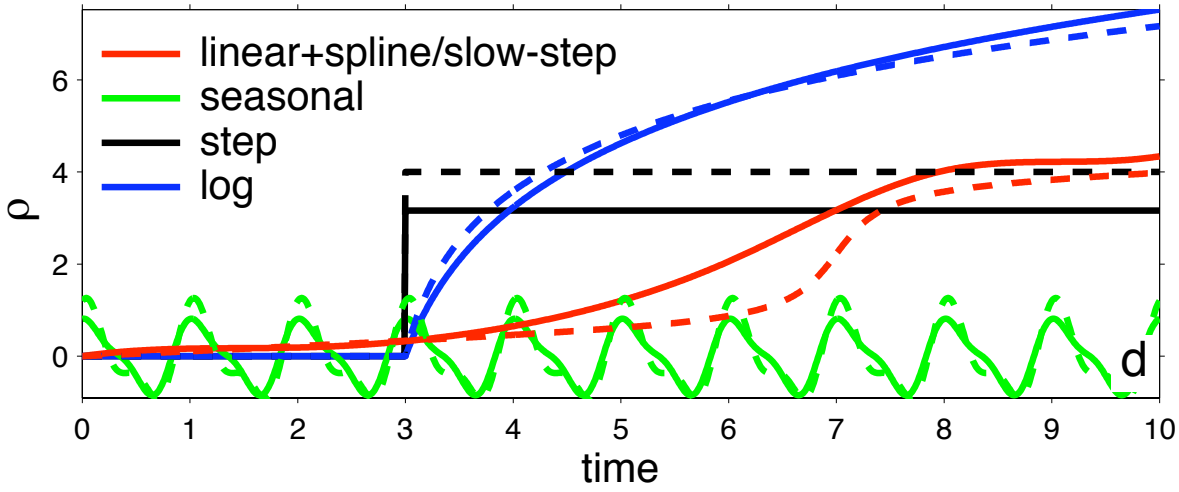
MINTS (Multi-scale InSAR time series)
Hetland et al., 2012

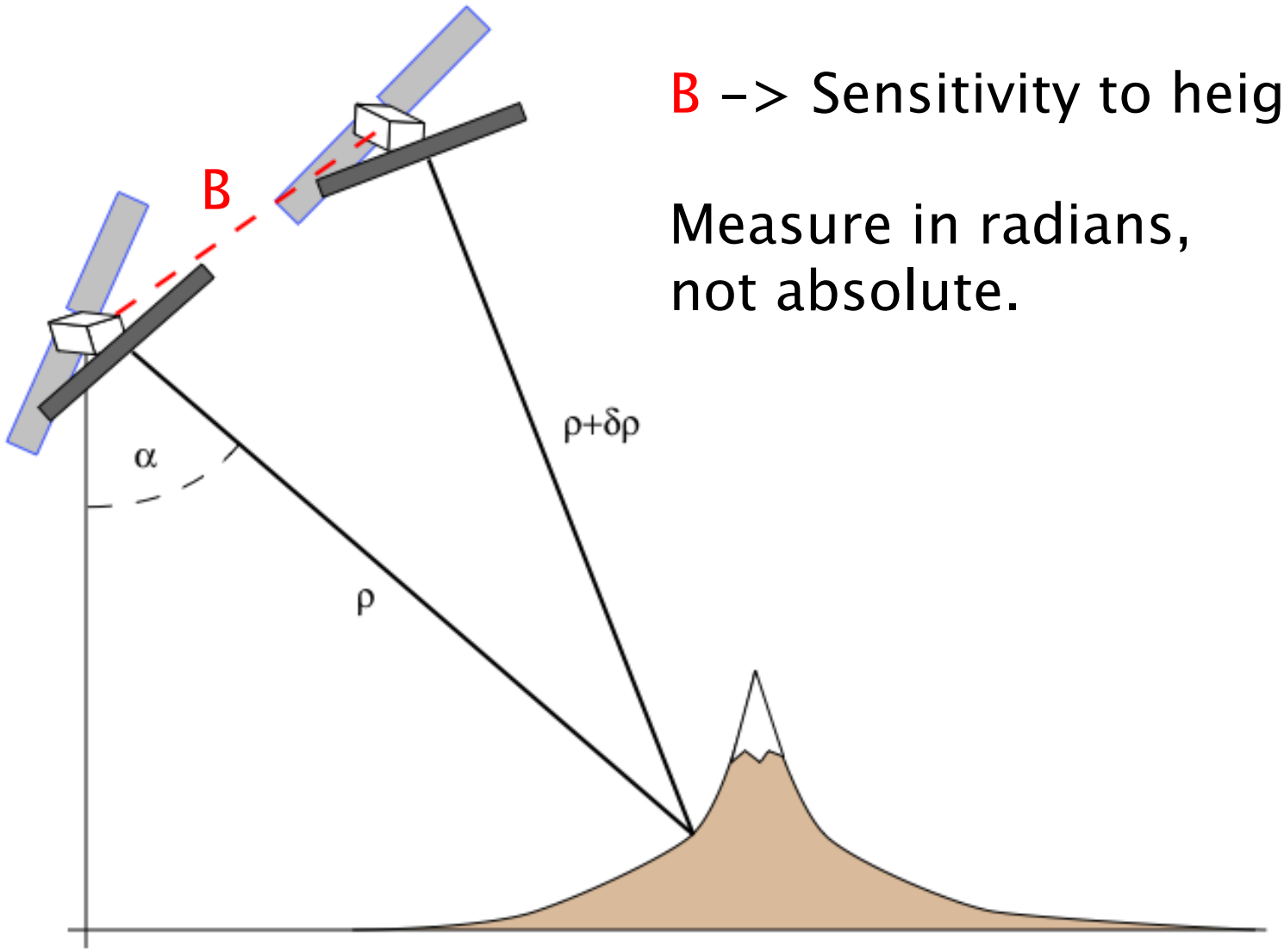
1. Wavelet decomposition of each interferogram

2. Time series analysis on wavelet coefficients

   Physical parameterization + splines for unknown signals



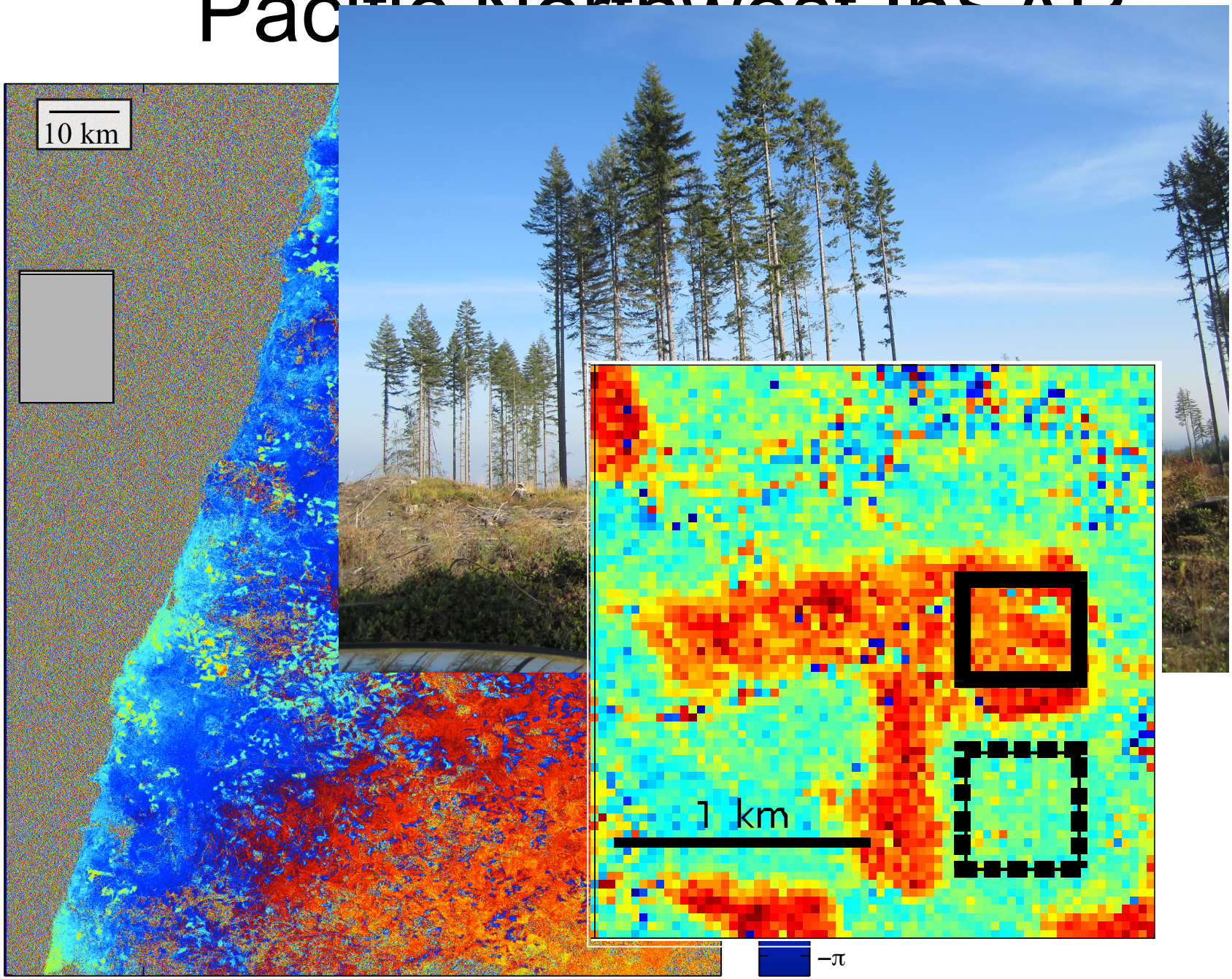
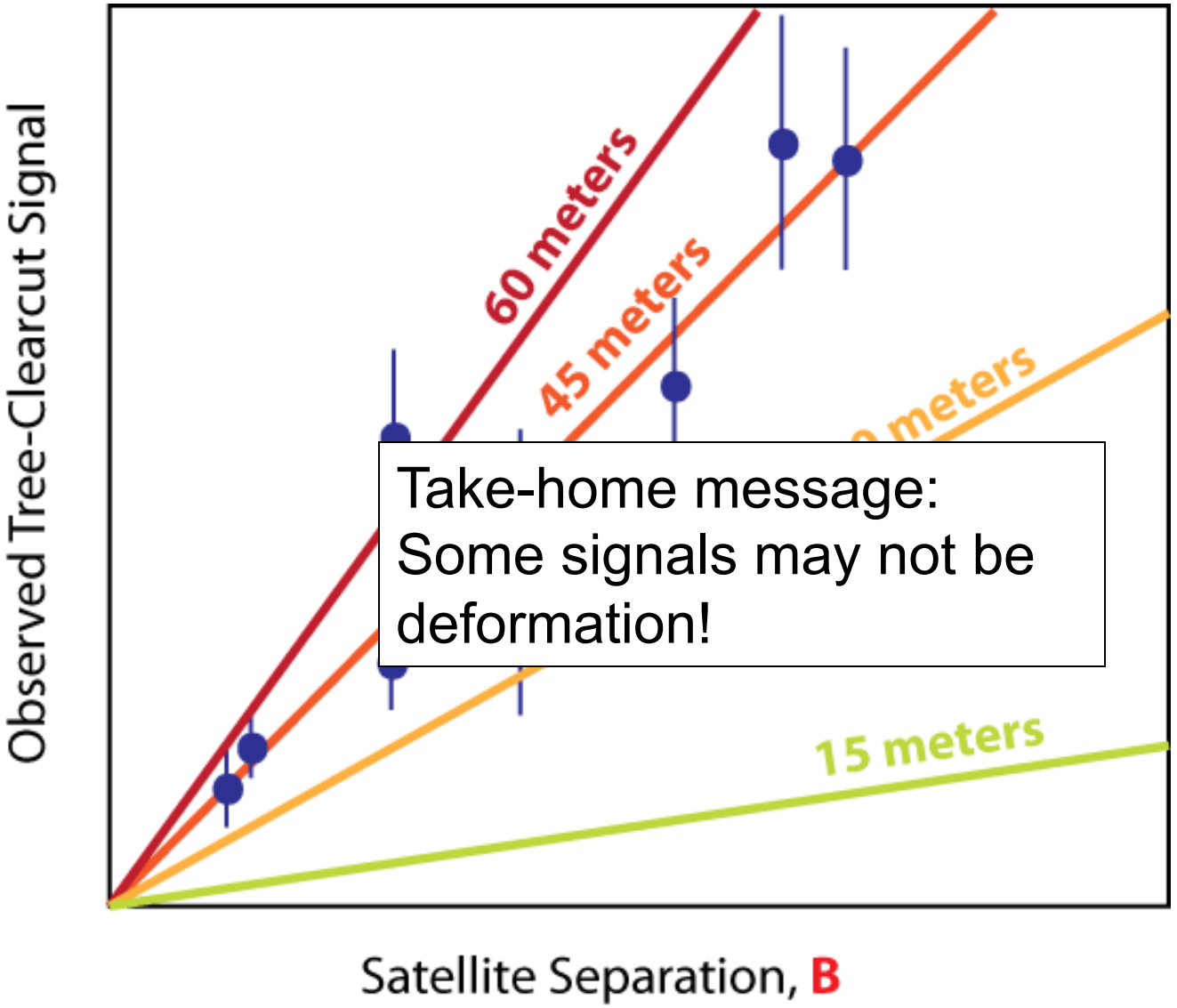




B -> Sensitivity to height

Measure in radians,
not absolute.

Pacific Northwest InSAR



Inferring tree heights from InSAR