

SEAMERGES INTRODUCTION LESSON

- Basics of GPS uncertainties/precision/errors
- Introduction to Plate tectonics
- Measuring plate tectonics/deformation with GPS
- Localized deformation on faults
- Co-seismic deformation

Basics of GPS uncertainties/precision/errors

1. what kind of noise/errors/uncertainties/unmodelled things affect the GPS precision : AS, SA, orbits, clocks, ionosphere, troposphere, antenna phase centers, centering (tribrachs), etc...
2. how do we evaluate GPS uncertainties ? (difference between formal and a posteriori) can we trust them ?
3. difference between precision and accuracy (internal consistency like repeatability is assertion of precision, comparison with other method affected by different biases is accuracy)
4. reference frames : how do we map ? with what precision ? What influence on results ?
5. difference between campaigns and permanent stations
6. spectral analysis of time series (noise/cyclic variations)

Introduction to plate tectonics

1. Lithospheric rigid plate definition (seismicity)
2. Rigid plate motions on a spherical earth : Euler pole.
3. Geological data and model for present day plate motion

Measuring plate tectonics/deformation with GPS

1. Measurement of plate tectonics with space geodesy
2. Rigid plate rotations
3. Plate deformation: strain and rotation tensors

localized deformation on faults

1. variation in space: arctangent elastic accumulation (theory and observations)
2. variation in time: seismic cycle , stick-slip, creep, silent slip, viscous relaxation

co-seismic deformation

1. observations and modelling
2. quantifying slip on faults planes
3. interactions of earthquakes and Coulomb stress transfer