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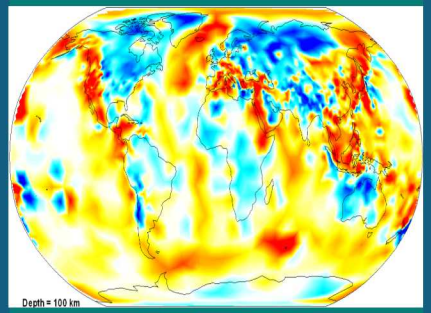
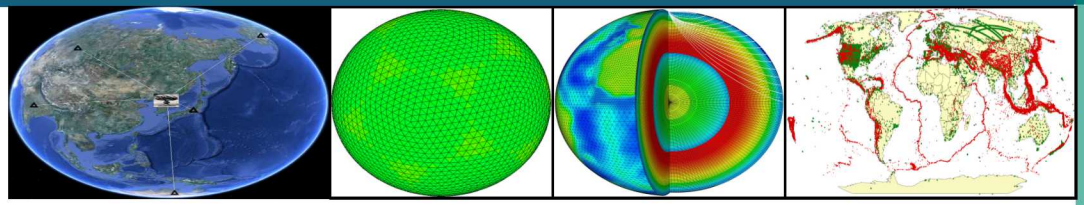
Outline of the GNDD Signal Propagation Project





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Signal Propagation Project

What is the GNDD Signal Propagation Project about?

- Program strives to improve our understanding of signal propagation through the solid earth (seismic) and atmosphere (infrasound)
- Purpose of improving the accuracy and precision of seismic event detection, location, identification and size estimation
- The program consists of 2 components (seismic & infrasound):
  - Development, testing, and demonstration of model prediction tools for seismic observables (e.g., travel times, phase amplitudes)
  - Development of model prediction tools for infrasound travel-times, azimuthal deviations, and transmission loss

Signal Propagation Project

What are the different aspects of the project?

- Travel time tomography for the creation of velocity models of the Earth
  - Dedicated computing hardware and software
  - Ray tracing techniques for 3D model of the seismic velocity
  - GeoTess – Support system for model parameterization in 3D Earth models
  - SALSA3D – Global 3D *P*-wave velocity model of the Earth's mantle
  - Supporting software tools
    - pCalc – Compute predictions of travel time, azimuth and slowness
    - LocOO3D – Event location technique involving a damped least-squares approach that uses 3D velocity models
- Waveform methods – Primarily to infer crustal structure (plan to extend it for mantle structure
- Infrasound – Development of a method that leverages ambient urban infrasound to distinguish between different atmospheric regimes in the planetary boundary layer