Note for array of array discussion: **earthquake source**

05/16/2013 starting at 11:10 am by Zhigang Peng, Pablo Ampuero,

Scientific targets and requirements (spatial resolution at the source, frequency, magnitude):

* Detailed rupture process of large earthquakes: Fundamental studies of earthquake physics + applications to tsunami hazard assessment and early warning and situational awareness (estimate damage from high-frequency shaking). Complement with dense near-fault array (strong motion) when possible. Target both shallow and deep earthquakes. Need to explore regional array processing for tsunami early warning. Back-projection distance: regional to teleseismic. Frequency range: 20 s to a few Hz for detailed rupture process (period < rise time). Smallest magnitude: M7-8?
* Estimate macroscopic source properties of smaller earthquakes (depth, location, size, duration, average rupture speed, directivity, stress drop, etc). Especially aftershocks of large earthquakes. Needed also for calibration of large earthquake back projection. Distance range: regional and teleseismic. Frequency range: a few Hz. Magnitude range: down to M5-6 aftershocks.
* Non tectonic: Atmospheric (up to half hour), primary and second microseims (1-20 s period band), Hum (~100 s), icequakes, glacial earthquakes (use long-period surface waves to locate sources without high-frequency radiation), landslides (long period)
* When possible, combine global targets with local targeted tectonic signals:
  + Smaller tectonic earthquakes: induced seismicity, etc. Frequency range: up to ~100 Hz, distance: local to regional.
  + Tectonic tremor: example of array of array in Cascadia, understand physical mechanisms of small earthquakes
  + Volcanic tremor: volcanic monitoring?
* Engage in the verification community (e.g., CTBTO) to improve detection, with a slightly different purpose (quiet place, discrimination with tectonic events, mining etc), a need for coverage in southern hemisphere. Politics concerns in certain regions. Frequency range: 1-6 Hz.

---

Discussion topics:

1. How to select a best site (old craton for better high-frequency)?

2. Possible co-locate instruments with infrasound, and other gravimeter, long-period tilt, GPS, etc.