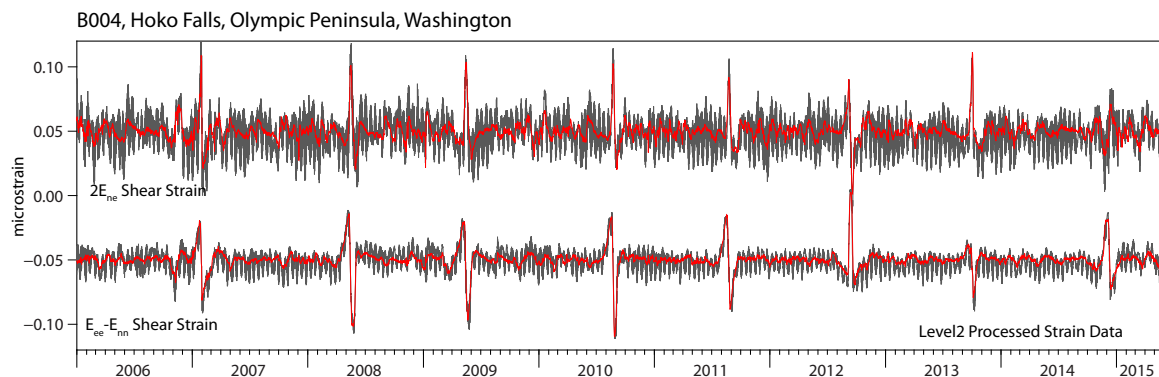


Ten Years Of Plate Boundary Observatory Borehole Strainmeter Operations and Data Products

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PBO's first borehole strainmeter, B004, was installed by UNAVCO on June 16th 2005 on the southwest shore of the Straits of Juan de Fuca on the Olympic Peninsula. It was the first installation in what would be the largest borehole strainmeter network ever built for research purposes in the US. Between June 2005 and October 2018 a further 74 strainmeters were installed as part of the EarthScope PBO project, each site forming part of a sub-array in a targeted area with specific scientific questions in mind. The purpose of the strainmeters was to record small, short period strain transients the size and duration of which would render them undetectable by GPS and seismology. Since then, PBO strainmeters have provided unprecedented temporal resolution of strain pulses that evolve over minutes, for example, nanostrain-level creep events on the central San Andreas, out to measurements of transients on the order of a 100 nanostrain over weeks during Episodic Tremor and Slip events along the Cascadia Subduction Zone. In the ten years since installation B004 has been operational 99.8% of the time with similar uptimes across the network excluding the ten volcanic installations which are unreachable in the winter months. The raw data are available to the research community in SEED format from the IRIS DMC within one to two hours of recording and processed data are available from UNAVCO within 24 hours. UNAVCO provides not just the time-series but also a rich metadata set that includes Level 2 processing information such as the Earth tide and barometric responses, drilling logs, borehole cuttings and access to station notes that capture observations made by UNAVCO field engineers about the site setting and instrument condition over the years. As of April 2015 more than 1 TB of PBO BSM raw data and products have been delivered to users and strainmeter data products have been downloaded by more than 1,400 unique users. In this presentation we will describe the PBO strain, seismic, pore and tiltmeter data sets available and show how UNAVCO monitors the data quality of each instrument type. Information on all PBO borehole datasets maybe found at <http://www.unavco.org/data/strain-seismic/strain-seismic.html> .



Shear Strains recorded by PBO borehole strainmeter B004. Lon-term trends removed, black traces contain the Earth tides and barometric pressure signals, red traces are the residuals after these signals have been modeled and removed. ETS events stand out clearly above the background noise.