

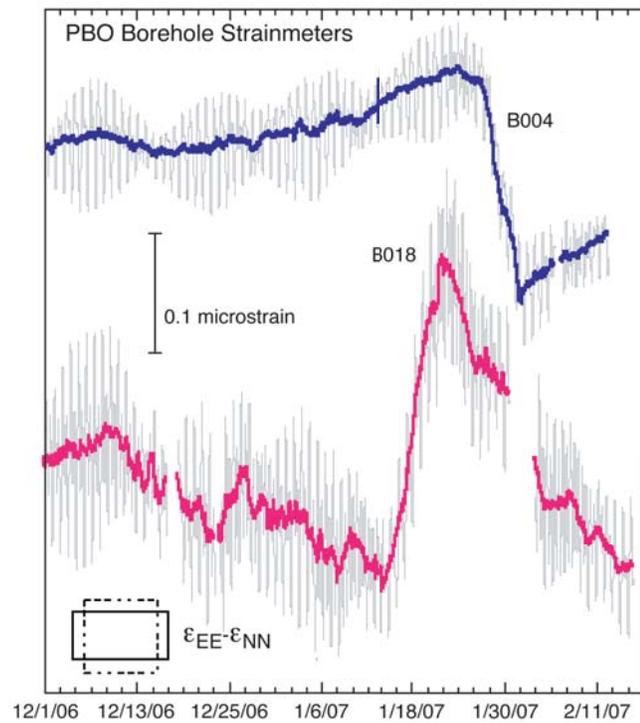
# Subduction Tremor and Slow Slip Recorded in January 2007 in Cascadia on the Plate Boundary Observatory Borehole Network

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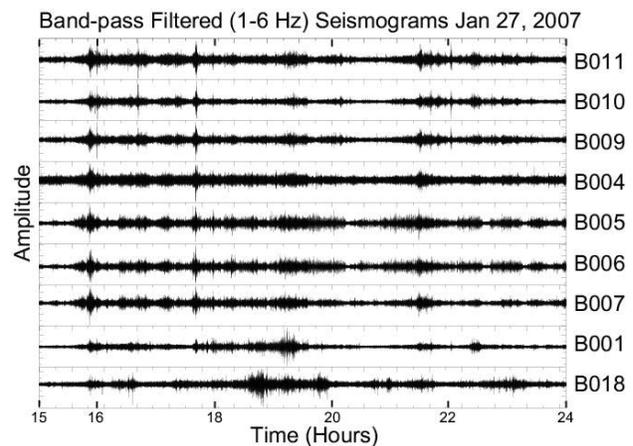
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The relationship between subduction tremor and slow slip events in Cascadia is being investigated using the PBO borehole strainmeters and seismometers. Though temporally correlated, it is not known whether the same source causes both the seismically-measured tremor and the geodetically-measured slow slip during tremor and slip events. During January 2007, a strain event is evident in the 5-minute data on several of the strainmeters (Figure 1), and the tremor is clearly visible on the borehole seismometers (Figure 2). The strain event first appears on strainmeter B018 (near Delphi, Washington) on all components by January 19. The maximum E-W contraction was around January 25, and high strain-rate

persisted throughout January. The strain changes began within days of the onset of strong tremor in the southern Puget Sound (as calculated by seismologists at the University of Washington). The strain event is evident on strainmeter B004 (northwestern Olympic Peninsula) by January 27, later than at B018 and consistent with the NNW migration of tremor epicenters (observed by scientists at the University of Washington). While the tremor signals are not yet evident on the 20-Hz strainmeter data, we are investigating the threshold of seismic event detection on the strainmeters in the frequency band of the tremor (1-6Hz).



**Figure 1.** PBO borehole strainmeter data from Washington State (5-minute samples) reveal large strain-rate changes in late January 2007. A trend has been subtracted from the data shown in gray; data after removing earth-tide variations are superimposed in color.



**Figure 2.** Nine hours of band-passed (1-6 Hz) tremor signals from January 27, 2007 on one of the horizontal components (EH1) of the borehole seismometers. Stations are ordered roughly north (top) to south (bottom). Bursts of tremor are evident on stations located on the southern end of Vancouver Island (B009, B010, and B011), northern Olympic Peninsula (B004, B005, B006, B007, and B001) and in the southern Puget Sound (B018).