V41A-08 - Tracking seismovolcanic tremor sources in depth at Kamchatka with a principal component analysis of array seismic data

📅 Thursday, 12 December 2019

🕐 09:45 - 10:00

📍 *Moscone South - 153, Upper Mezz.*

Abstract

We present a method for automatic location of dominant sources of seismovolcanic tremor in 3-D, based on the spatial coherence of the continuously recorded wavefield at a seismic network. We analyze 4.5 years of records from the seismic network at the Klyuchevskoy volcanic group in Kamchatka, Russia, when four volcanoes experienced tremor episodes. After enhancing the tremor signal with spectral whitening, we compute the daily cross-correlation functions related to the dominant tremor sources from the first eigenvector of the spectral covariance matrix and infer their daily positions in 3-D. We apply our technique to the tremors beneath Shiveluch, Klyuchevskoy, Tolbachik, and Kizimen volcanoes and observe the yearlong pre-eruptive volcanic tremor beneath Klyuchevskoy from deep to shallow parts of the plumbing system. This observation of deep volcanic tremor sources demonstrates that the cross-correlation-based method is a very powerful tool for volcano monitoring.

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