J O U R N A L C L U B

Infrasound Associated with the 2002 Denali Fault Earthquake, Alaska

by

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ABSTRACT

Infrasonic waves associated with the November 3, 2002, magnitude 7.9 earthquake in Alaska were detected by the microphone array (I53US) in Fairbanks, Alaska. The epicenter of the earthquake lay some 135 km south of the Fairbanks array. Both seismic and acoustic signals were recorded successively by the microphone array. The fault rupture of the earthquake moved east-southeast along the Denali-Totschunda system fault for approximately 294 km. The northern side of the fault moved to the east and vertically upward relative to the southern side. Displacements up to 8.8 meters were measured at various points along the fault. The seismic P-wave signal arrived at the array approximately 27 seconds after epicenter shock with a trace velocity of 5 km/sec. This was followed, some 12 minutes later, by an infrasonic wavetrain that had an average trace velocity of 0.34 km/sec and lasted about ten minutes. The azimuth of arrival of the infrasonic waves steadily moved eastward throughout the wave train apparently following the rupture's leading edge along the fault. The largest infrasonic signals, reaching over 12 Pa, came from the azimuth of the regions of largest ground motion along the fault. The source of the infrasound is taken to be the sudden local motion of the mountains in the Alaska Range along the Denali fault as they responded to the eastward-propagating fault rupture.

Friday, September 12, 2003
Elvey Bldg. Globe Room
3:45 pm