

Broadband (Seismic) Experiment Across the Alaska Range

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BEAAR is a three year, passive broadband seismic experiment directed at imaging the crustal and upper mantle structure beneath the Alaska Range in central Alaska. The dense phase (approximately 10 km spacing) of the experiment occurred during the summer of 2000, with a total of thirty-six broadband seismometers (Guralp CMG-3T and CMG-3ESP) deployed in a roughly north-south line between Nenana and Talkeetna along the Parks Highway between Fairbanks and Anchorage. Several stations were deployed in an east-west cross line which extends parallel with the Alaska Range into Denali National Park. The instrumentation is on loan through Incorporated Research Institutions for Seismology (IRIS) Program for the Array Seismic Studies of the Crustal Lithosphere (PASSCAL), and the equipment for the remaining seventeen stations will be run continuously through the fall of 2001.

Receiver function analyses of teleseismic events provide an estimate of the crustal thickness beneath each station, while the close spacing of the stations allow for detailed spatial correlation of the arriving phases. Crustal thickness in the Fairbanks area, north of the Alaska Range is about 27 km. Results indicate that the crust thickens beneath the Alaska Range to a maximum of about 45 km near the center of the range. The crust remains fairly thick south of the Alaska Range (35-40 km) in a region of fairly broad uplift. At the southern end of the study area the continental crust is underlain by the subducting Pacific plate, producing an extremely thick section of crustal material, possibly up to 50 or 60 km thick.