Lithoprobe east: 650 km of deep seismic reflection profile across the Appalachians, onshore Newfoundland

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Six hundred fifty kilometres of land Vibroseis seismic reflection data were collected during 1989 on three profiles across parts of the Appalachian mobile belt in Newfoundland. Data were collected 60 fold on an asymmetrical split spread with CMP spacing of 25 m with 4 ms sampling to 18 s record length; four vibrators were used, sweeping from 8 to 56 Hz, for a total effort of 112 s per v.p. Special experiments were conducted at some locations to record extra long and/or broadside offsets, for superior structural and velocity control. Fifteen kilometres of high resolution data, with 10 m CMP spacing, and 2 ms sampling, were recorded together with the regional data across a mineralized zone at Buchans in central Newfoundland. An overview of the data shows that (i) there is much more reflectivity in the upper crust than was apparent from earlier adjacent marine profiles, (ii) dipping reflectors can be traced to within less than 1 km of the surface and sometimes can be correlated with known geological boundaries, though the major terrane boundaries are not always clearly imaged as either reflectors or boundaries of reflection character, (iii) the polarity of dip reflectors, previously interpreted as shear zones, is similar to that observed offshore, so that interpolation of the major deep structures across Newfoundland is now possible, and (iv) the high resolution data has successfully imaged lithological units and deformation zones in the near surface mineralized zone.