



Automated Interval velocity picking for Atlantic Multi-Channel Seismic Data

Vishwajit Singh

Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India, (vsingh.geophs@gmail.com)

This paper described the challenge in developing and testing a fully automated routine for measuring interval velocities from multi-channel seismic data. Various approaches are employed for generating an interactive algorithm picking interval velocity for continuous 1000-5000 normal moveout (NMO) corrected gather and replacing the interpreter's effort for manual picking the coherent reflections. The detailed steps and pitfalls for picking the interval velocities from seismic reflection time measurements are describe in these approaches. Key ingredients these approaches utilized for velocity analysis stage are semblance grid and starting model of interval velocity. Basin-Hopping optimization is employed for convergence of the misfit function toward local minima. SLiding-Overlapping Window (SLOW) algorithm are designed to mitigate the non-linearity and ill- possessedness of root-mean-square velocity. Synthetic data case studies addresses the performance of the velocity picker generating models perfectly fitting the semblance peaks. A similar linear relationship between average depth and reflection time for synthetic model and estimated models proposed picked interval velocities as the starting model for the full waveform inversion to project more accurate velocity structure of the subsurface. The challenges can be categorized as (1) building accurate starting model for projecting more accurate velocity structure of the subsurface, (2) improving the computational cost of algorithm by pre-calculating semblance grid to make auto picking more feasible.