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(54) Title: METHOD FOR SEISMIC DATA PROCESSING USING DEPTH SLICE DECOMPOSITION

(57) Abstract

A method of processing geophysical data on a parallel processor involves decomposition of an analysis cube into depth slices, a second decomposition of a data acquisition cube into traveltimes slices, and determination of a variably dimensioned analysis aperture. Precomputed traveltimes are stored in packed format to minimize storage volume and data bandwidths. A processing simulation is performed to optimize the stored sequence of the seismic trace data and to minimize traveltimes input/output demands. The method preferably assigns input/output, analysis, or control tasks to each processor, with depth and traveltimes slices assigned to each analysis processor. The method relies on staged access of traveltimes fields from high speed mass storage (104) to disk storage (108) and via the input/output processors (100) to analysis processor memory. Seismic trace data are also staged, preferably from tape storage to disk storage to processor memory, and preferably are broadcast under the control of a host computer. The method allows multiple common offsets to be simultaneously processed, and can be carried out on any type of parallel processing computer.

