

ABSTRACT

SYSTEMS AND METHODS FOR FREQUENCY-DOMAIN FILTERING AND SPACE-TIME DOMAIN DISCRIMINATION OF SEISMIC DATA

Computational systems and methods that combine global frequency-wavenumber-domain (" f - k domain") filters with localized eigenimage based event selection to generate a resulting wavefield with reduced filter imprints on gather edges, reduced noise, and correct treatment of aliased energy are disclosed. The methods are executed by applying filters to the full set of seismic gather data in the f - k domain in order to obtain a resulting wavefield from recorded pressure and/or particle velocity data. The output of the filter is iteratively decomposed according to local dip values using eigenimage processing based on singular value decomposition ("SVD"). The same sample locations are extracted using SVD from the input in addition to generating input for a subsequent iteration with already processed data removed. Eigenimage processing methods allow for correct treatment of spatially aliased energy in f - k domain filtering.

FIG. 5