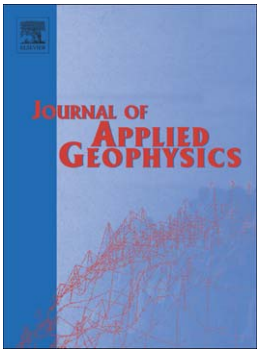

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Iterative dip-steering median filter

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ABSTRACT

Seismic data are always contaminated with high noise components, which present processing challenges especially for signal preservation and its true amplitude response. This paper deals with an extension of the conventional median filter, which is widely used in random noise attenuation. It is widely known that the standard median filter works well with laterally aligned coherent events but cannot handle steep events, especially events with conflicting dips. In this paper, an iterative dip-steering median filter is proposed for the attenuation of random noise in the presence of multiple dips. The filter first identifies the dominant dips inside an optimized processing window by a Fourier-radial transform in the frequency-wavenumber domain. The optimum size of the processing window depends on the intensity of random noise that needs to be attenuated and the amount of signal to be preserved. It then applies median filter along the dominant dip and retains the signals. Iterations are adopted to process the residual signals along the remaining dominant dips in a descending sequence, until all signals have been retained. The method is tested by both synthetic and field data gathers and also compared with the commonly used f-k least squares de-noising and f-x deconvolution.

KEYWORDS: noise attenuation; median filter; Fourier-radial transform; dominant dip.

1. INTRODUCTION

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