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Algorithm that allow observe the degree of anisotropy and fracturing

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In this work we propose an algorithm based on the principles of the method of birefringence, that allows us to observe the degree of anisotropy and fracturing in the crust of the earth, from the analysis of the seismic phases, allowing us to determine the risk of a zone and its potential in the exploitability shallower areas of the crust.
The algorithm consists in analyzing the three components of the seismic record of each seismic station, to obtain: 1) the waves field S by means of the covariance matrix, 2) separate the phases faster and slow (birefringence method) using cross-correlation propose by Bowman et al. (1987) and Chichinina (2014), 3) get the magnitude of birefringence as well as the delay time propose by Zhang (2012), 4) obtain the magnitude and depth of the seismic event and 5) propose an elastic model isotropic and heterogeneous with vertical fractures, using the wave speed of P and S from the density and the lame constants for the different strata proposed (direct model). This allows us to obtain the times of arrival of the phases of P wave, S wave faster (S1) and the S wave slow (S2) and get a speed ratio by means of the proposed model, which is adjusted with the times of the phases obtained, and thus obtain the parameters of Thomsen of degree of anisotropy and density of fracturing propose by Assad et al. (1992). In the same way is analyzed the addresses of polarizations of the anisotropy by means of hodograms.