



Seismic phase picking based on wave characteristics

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Aim of the present work is to adapt and develop an algorithm for extracting first motion information from earthquake seismograms. In specifics, the present paper deals with the characterization of the z component of a given seismogram in order to discriminate an earthquake signal from noise recording.

Segmentation and further classification of the seismogram comprises the initial step. The earthquake detection (P arrival) is performed using a low computation cost method based on signal energy. Furthermore, accurate picking of S arrival is based on signal energy and central frequency estimation.

The method is based on robust features and it is simple and fast. We use just energy and local maxima – minima of the signal in order to accurately estimate the central frequency, since the given signal is normally noisy, so more complicated features will be affected by the very low signal to noise ratio. The proposed scheme yields the “quality” of estimation. This value corresponds to the reliability of estimation and it can be used to recognize if the given signal corresponds to an earthquake signal or not. Moreover, the whole procedure is mainly automatic. It does not require any parameter. However, the user can change easily the window sizes, or modify the output file.

Experimental results show satisfied efficiency of the pre-mentioned scheme, low processing time and potential application in real-time environment.

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