

Learning and Template Matching Detectors Methodology to Seek for Seismic Clusters in the Central Andes within the Bolivian Orocline

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The Bolivian Orocline is part of the Central Andes, where the high compressional crustal strains owns complex systems of geological faults that may be active and might produce destructive earthquakes, such as the Aiquile 1998. Generally, some foreshock and aftershock happens, however, those may have lower magnitudes that are difficult to detect. Nowadays, it is possible to detect any seismic or explosion event using a seismic network deployed in a specific region, therefore, any seismic station within the network will record seismic signals as waveforms templates. Furthermore, those signals and the bulletins might serve as input to train neural networks to detect or to classify natural or artificial events. The OSC-NDC presents how a daily routine workflow helped us to detect seismic clusters using three seismic stations, and how we enhanced those detections by installing a temporary seismic network within the Bolivian Orocline applying deep learning techniques. Results are promising, shallow low magnitude earthquakes around the Bolivian Orocline are being detected, most of them belonging to a seismic cluster and might guide us to map the seismicity.

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Promotional text

This research was possible with data from the IMS seismic network (LPAZ-PS06, SIV-AS08) and one local broadband sensor (SOET). Those seismic stations served us waveforms templates generators. Then, a deep learning model was trained with these data and enhanced the detections.

Oral preference format

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