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Low magnitude earthquakes relocation in the Armorican Massif (NW France)

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The Armorican Massif is part of the Paleozoic Hercynian Range of Western Europe. This intraplate region is affected by moderate size earthquakes, with magnitudes lower than 5. Since 1980, approximately 1500 events were detected and located by the French seismic networks (LDG, RéNaSS). The French organization BCSF collects all these data and provides a catalogue of arrival times and locations. According to the locations performed so far, the spatial distribution of the earthquakes is diffuse, and none of the known tectonic features seem to be preferentially reactivated by the current stress fields. However these locations are mostly derived from arrival time data with large uncertainties. Indeed, the mean horizontal and vertical uncertainties are $\sim$ 15 km and $\sim$ 60 km, respectively ! In order to improve the latter locations, we first check all the phase picks on the available seismograms, corrected from Finite Impulse Response (FIR) effects whenever necessary. We then determine an appropriate velocity structure, and finally perform both absolute and relative relocations for the whole dataset.