

EGU2020-18574

<https://doi.org/10.5194/egusphere-egu2020-18574>

EGU General Assembly 2020

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Earthquake density along the Western Alpine Arc

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We propose a new analysis of the W-Alpine seismicity based on space and time distributions along the Alpine arc. The overall area bears witness of a relatively important seismic activity localized along the so-call Briançonnais and Piemontais seismic arcs, but also along alignments corresponding to individualized active fault, e.g. in front of the Belledonne massif, and locally in form of important seismic swarms (Ubaye, Maurienne, Mont-Blanc). The regional tectonic regime is well analyzed (see for instance Mathey et al., this session), with detailed mapping of both the stress and strain fields. However, actual available studies do not take into account the time and space distributions. Our study is developed using several available datasets covering various time spans and various strategies (local and regional seismic networks, template matching, historical seismic catalogue). We focus firstly on the space distribution of the activity along the arc, taking into account: (i) the simple occurrence of seismic events to calculate regional density maps, also investigating the B-value mapping; and (ii) the energy density, using the seismic moment fluxes per surface unit as a proxy. On this basis, we secondly analyze the time evolution of the seismicity, which is actually limited by the available dataset's time span. Our integrated analyze focusses on 3 primary targets: (i) to compare the information arising from the different databases; (ii) to compare the most active zones in terms of earthquake occurrence vs. seismic energy released; (iii) to unravel potential evolutions or establish relative steadiness in alpine seismicity through time. This work will finally allow to better understand and discuss the Alpine seismicity's mechanisms, in relation with the actual dynamics of this orogen.