



Could Erosion in the Western Alps triggers large earthquakes in the Ligurian basin ?

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Present day convergence rates across the Western Alps are below the uncertainty threshold of the continuous GPS measurements (< 0.3 mm/yr), but unexpectedly, the vertical rates derived from the GPS are significant and up to 2 mm/yr. Furthermore, the range is underlined by moderate but frequent instrumental seismicity. Focal mechanisms show extension in regions of moderate to high elevations with a direction normal to the Western Alps range axis, while their foreland is associated to strike slip and thrust faulting. How can be explained these very high uplift rates and seismotectonic regime in an intraplate like kinematic deformation pattern remains an open question.

Recent 2D finite element models have tried to answer to this question by showing that erosion of mountain topography in low convergent zones induces a significant deformation of the lithosphere. These models suggest two distinct seismotectonic zones characterized by extension and uplift below the moderate to high topographic mountain range and shortening in foreland. However, these models where not applied to a specific case study.

Present-day deformation at the Alps-Ligurian basin junction is expressed by earthquakes, the last deadly was in 1887, with an estimated magnitude of $M_w=6,7-6,9$. Many hypotheses are suggested to explain this active deformation. Using a 2D cross-section of the Alpine-Ligurian margin, we study the effects of the erosion of the south-western Alps on the deformation pattern of the Ligurian Basin, and the possible triggering of earthquake like the 1887 one.