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# Lithosphere strain rate and stress field orientations across the Alpine front

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In this study we test whether principal components of the strain rate and stress tensors align within Switzerland. We find that 1) the Alpine front is the most relevant tectonic boundary separating different domains of crustal stress / surface strain rates orientations and 2) orientations of T- axes (of moment tensor solutions) and long-term asthenosphere cumulative finite strain (from SKS shear wave splitting) are consistent. Additionally, we show that directions of principal components of both strain rate and stress tensors agree with orientations of shear wave splitting, implying that the Alpine arc is sheared by large-scale processe(s) taking place in the asthenosphere. At a more local scale, we find that seismic current activity and surface deformation are not in agreement in three regions (Basel, Swiss Jura and Ticino), possibly because of the low levels of deformation and seismicity. In the Basel area, deep seismicity exists while surface deformation is absent. In the Ticino and the Swiss Jura, where seismic activity is close to absent, surface deformation is detected at a level of ∼2x10-8/yr.