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Permanent GPS network around the bend of the Jura Arc: preliminary results

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The Jura Mountain, the westernmost belt of the alpine orogeny, is one of the best-studied orogenic arcs in the world. The Jura arc is a typical fold-and-thrust belt, with a main décollement thrust localized in the Triasic evaporites under the Jurassic-Cretaceous series. It is directly linked to the alpine orogenic wedge, especially in term of critical taper. It is supposed to be still active in collision mode, which would rise up the issue of its relation with the Alps to the East, currently undergoing post-orogenic gravitational potential adjustment. Nevertheless, its current activity and recent deformation remain a matter of debate, few neotectonic-related data being available in this area. The Jura is crosscut by left-lateral strike-slip faults in a radial scheme with respect to the arc, and recent seismicity along one of them, the Vuache fault (Annecy earthquake Ml 5.3 1996), and at the northern front of the belt (Beaume-les-Dames earthquake, Ml 5.1, 2004), argues for ongoing active deformation across the Jura Mountain. Here we present preliminary results of permanent GPS network surrounding the Jura belt (RENAG and RPG data), which tend to show very slow, yet self-consistent strain pattern of the order of some tenth of mm/yr over 100 km-long typical baselines, with shortening perpendicular to the arc, and extension parallel to its axial trend. We also characterize a slow uplift in the same order of magnitude, which appears to be correlated to the current uplift observed in the Alps. Indeed, the uplift velocities are continuously decreasing from the core of the Alps (+2 mm/yr) to the westernmost part of the Jura (+0,4 mm/yr) and to the stable foreland (-0.1 mm/yr). Actually, from the Po plain to the Jura foreland, the GPS-related uplift velocities are well correlated to the topography, and the Jura arc appears connected to the Alps from this point of view. In order to better determine the deformation pattern in the Jura arc, we present a new regional GNSS permanent network (GPS-JURA, Besançon observatory) developed at the end of 2013, which will allow in a near future to accurately characterize and quantify the current strain pattern of this emblematic arc.