KINEMATICS, SEISMOTECTONICS AND SEISMIC POTENTIAL OF THE EASTERN SECTOR OF THE EUROPEAN ALPS FROM GPS AND SEISMIC DEFORMATION DATA

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We present a first synoptic view of the seismotectonics and kinematics of the eastern sector of the European Alps using geodetic and seismological data. The study area marks the boundary between the Adriatic and the Eurasian plates, through a wide zone of deformation including a variety of tectonic styles within a complex network of crustal and lithospheric faults. A new dense GPS velocity field, new focal mechanisms and seismic catalogues, with uniformly recalibrated magnitudes (from 1005), are used to estimate geodetic and seismic deformation rates and to develop interseismic kinematic and fault locking models. Kinematic indicators from seismological and geodetic data are remarkably consistent at different spatial scales. In addition to large-scale surface motion, GPS velocities highlight more localized deformation features revealing a complex configuration of interacting tectonic blocks, for which new constraints are provided in this work accounting for elastic strain build up at faults bonding rotating blocks. The geodetic and seismological data highlight two belts of higher deformation rates running WSW-ENE along the Eastern Southern Alps (ESA) in Italy and E-W in Slovenia, where deformation is more distributed. The highest geodetic strain-rates are observed in the Montello-Cansiglio segment of the ESA thrust front, for which the higher density of the GPS network

provides indications of limited interseismic locking. Most of the dextral shear between the Eastern Southern Alps and the Eastern Alps blocks is accommodated along the Fella-Sava fault rather than the Periadriatic fault. In northern Croatia and Slovenia geodetic and seismological data allow constraining the kinematics of the active structures bounding the triangular-shaped region encompassing the Sava folds, which plays a major role in accommodating the transition from Adria- to Pannonian-like motion trends. The analysis of the seismic and geodetic moment rates provides new insights into the seismic potential along the ESA front.