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Horizontal motion vectors from a network of permanent GPS stations in northeastern Italy

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The data of a permanent network of GPS stations located in northeastern Italy were used to estimate the station horizontal motion vectors. The observed motions were compared to the estimates provided by the NUVEL1A NNR plate motion model. The results indicate that these sites are moving faster than predicted by the model and with azimuths slightly more northward oriented. The GPS-derived velocities with respect to stable Europe of the stations in the Veneto and Friuli Venezia-Giulia regions indicate a N-S shortening in the order of 2-to-3 mm/yr. The data also suggest NE-SW shortening of a few mm/yr between Trieste, located at the leading edge of the Dinarides orogen and the Emilia-Romagna Marina di Ravenna, Medicina and Bologna sites positioned above the Apennines accretionary prism. This can be interpreted either as active thrusting of the Dinarides or/and active thrusting in the Apennines accretionary prism. Seismic reflection profiles and seismicity indicate that both orogens are active, but the Dinarides appear to have slower convergence rates.