



Integration of geodetic, tide gauge and geomorphologic data in determining crustal movement at the NE-border of the Adria plate, Italy

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This research integrates geodetic, tide gauge and geomorphologic data in order to obtain a coherent estimate of crustal movement at the NE border of the Adria plate, which is believed to be pushing northward into the Eurasian plate. We have analysed the exceptionally high quality records of a couple of long-base tiltmeters (Braitenberg, 1999; Braitenberg and Zadro. 1999), which cover the timespan of 39 years of data, up to present. The instrumentation has recently been converted into a ultra broad band tiltmeter, by introducing a high resolution digital acquisition system. The instruments record tilt in a natural cave carved into the Trieste Carst. By linear interpolation we retrieve an average NW tilt of 41 nrad/year, which we show to be independent from ambient factors as ocean loading effects, temperature and pressure variations. The question arises, whether this tilt is a local phenomenon of the cave, or can be extrapolated to the Carst block. We find that the signal can be considered regional, from the fact that it is in excellent agreement with tide gauge observations and recent results from geomorphological investigations. We analyse 6 tide gauge stations located along the eastern coast of the Adriatic Sea, using the data from the PSMSL database and determine the differential sea level rise rates. We find systematic differences in the sea level rise rates calculated over the recent 50 years, that are compatible with a NW tilting as observed from the tiltmeters. At last we compare our findings with published results obtained from geomorphology, which also point towards a NW tilting, which has been active since plio-quadernary (Antonioli et al., 2004).

Antonioli F., G.B. Carulli, S. Furlani, R. Auriemma, R. Marocco, 2004, The enigma of submerged marine notches in northern Adriatic Sea, Quaternaria Nova, in press.

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