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Important events of rotations in the Carpatho-Pannonian region during the lifetime of the Parathetys

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As the estimated rate of reduction in distance between stable Europe and Africa dropped from 12 km/Ma to 7 km/Ma, at around 20 Ma, large scale rotations started in the Carpatho-Pannonian region. The oldest of them (occurring in the 18.5-17.5 Ma interval) can be related to tectonic escape from the East-Alpine realm, coupled with subduction pull. Subduction pull accounts also for those occurring between 16 and 14.4 Ma and around 12 Ma, respectively. The block rotations, with respect to the present North are counter-clockwise everywhere, except in the Apuseni Mts. The youngest events detected paleomagnetically took place in the time interval of 4-6 Ma and were most probably triggered by the counter-clockwise rotation of the Adria microplate. Rotations affecting the same tectonic unit are of cumulative nature. Repeated rotations in the same sense caused large declination deviations from the present north. The largest declination deviations in the subject area were measured on lower Miocene and Paleogene rocks in the North Hungarian - South Slovakian Paleogene basin, in the Transdanubian Range and in the Apuseni Mts, up to 90° in the counter-clockwise and in the clockwise sense, respectively. Mid and late Miocene rocks from the mentioned areas are characterized by moderate (about 25-40°) rotations. The paleomagnetic observations to date suggest that the mobility in the Carpatho-Pannonian region during the Miocene was high. Therefore, paleogeographic reconstructions for the Parathetys would benefit from the incorporation of paleomagnetic data.