## Present Day Geokinematics of Central Europe

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### Europe is continuosly evolving

• From

http://pnac.swis stopo.admin.ch/ divers/dens vel/ 000.html#VELOC ITIES



#### Main tectonic features:

Convergence of Adria to European Platform results in a Eastwards extrusion towards the Pannonian basin acting as an unconstrained margin

The Pannonian basin is bordered by the Carpathian belt and includes the AlCaPa and TD terranes, separated by the MHZ. Vrancea is seismically active at depth

TESZ: prominent lithospheric structure separating the ancient EEC from the younger European plate

Hellenic Arc – South Balkans: extensional regime related to anticlockwise rotation of Anatolia. Decouplig from NE Adria-Dinarid convergence through the Kephalonia Transform Fault



CEGRN Results 1. : velocity drop ( ca 1 mm/yr in 100 km, or 10 nstrain/yr) across TESZ and Carpathians suggests that a small E to W compression is still active



CEGRN Results 2. : velocity inversion ( ca 1 mm/yr in 100 km, or 10 nstrain/yr) across SEMP/MMZ suggests that Eastwards extrusion of the Eastern Alps is still active, with a locking depth of ca. D = 18 km



CEGRN Results 3. : velocity increase across Peloponnesos and W Mediterranean suggests a N S extension driven by the rollback and retreat of the Nubia





### Conclusions

- CEGRN: multinational, long lasting partnership results in a dense velocity field in Central Europe
- Data reduction made using the latest IGS/EUREF standards ensures absence of local biases in orientation and scale of the Central European velocity field
- Analysis of the velocity profiles reveals that:
  - the extensional strain rate across the Hellenides matches the is a consequence of the 'rollback and retreat' of the African plate. This motion can be modeled analytically with the flexure of an elastic plate subject to time dependent vertical shear force and / or bending moment.
  - Southern Alps are eastward extruded at ca 1.8 mm/yr (+/- 0.4 mm/yr) relative to stable Europe; profile consistent with a vertical fault and a 18 km locking depth → slip takes place in the basement of the European plate.
  - There exists a velocity drop of about 1 mm/yr in 100 km across the TESZ and the Eastern Carpathians suggesting a compressional stress orthogonal to the orogen: is the subduction of the East European unit underneath the Carpathians still active?

