MODELLING OF TERTIARY TO PRESENT DAY STRESS FIELDS IN THE IBERIAN PENINSULA AND RELATED INTRAPLATE DEFORMATION

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The Iberian Peninsula experienced from E. Tertiary onward stress fields that changed rapidly in form, orientation and attitude. Oblique collision with Eurasia starting in L. Cretaceous-E. Paleogene created a stress field with Shmax NNW-SSE, rotating in time to N-S or even NNE-SSW with major deformation in the Pyrenees and off shore Cantabria. A jump in active plate boundary to the south in M. Miocene relocated the major deformation front to the Betics and caused an uniaxial compression, Shmax NNW-SSE. Opening of the Valencia Trough to the E side of the plate readjusted this stressfield during L. Miocene to extension in the Valencia area and strike slip in the interior of the plate. Due to the ongoing convergence between Africa and Eurasia/Iberia the NNW-SSE compressional stress field has been reactivated from L. Pliocene. Several overlaps in time and place of the described regional stress fields caused very diverse local stress fields. Most of these stress stages are well documented in the deformation of the interior of the plate. Field data (micro- and meso-structural) provide constraints for the orientation of the stressfield through time and place. The results of first order numerical modelling of the (paleo)stress fields by plate boundary changes and differential opening of the North Atlantic are compared with the obtained stress trajectory maps for different timeslices from E Tertiary onward to test hypotheses on the evolution of both plate boundaries of the Iberian microplate as well as its internal deformation.

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