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A new look at the seismo-tectonics of Portugal

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Portugal lies on the south-westernmost tip of Europe, next to the boundary between Eurasia and Africa. The slow oblique convergence between Iberia and Nubia is accommodated along a broad region of diffuse deformation rather than along a single plate boundary. Individual faults have low loading rates, which result in long time intervals between earthquakes. The geographic location of Portugal adds to the challenges that seismological investigations in the region face.

In the period 2010-2012 a dense network of temporary seismic stations was deployed in Portugal, within the scope of project WILAS (West Iberia Lithosphere and Astenosphere Structure). This deployment, together with permanent stations, yielded a wealth of seismic data that now allow an improved look at the seismotectonics of Portugal.

In this presentation we will review the major findings of project WILAS, namely: 1) improved earthquake locations, which allow the identification of epicenter lineaments previously absent on seismicity maps; 2) an improved database of focal mechanisms, resulting both from careful waveform moment tensor inversion and analysis of first motion polarities; 3) depth of crustal discontinuities, as inferred from receiver function analysis; 4) maps of seismic velocities, obtained from the inversion of surface wave dispersion curves extracted from ambient noise analysis. We will compare our results with previously established models.

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