

Paper Number: 3717

## Stress field in the Western part of Africa-Eurasia boundary from the Azores to Tunisian Atlas.

**Ousadou F<sup>1</sup>., Ayadi A<sup>1</sup>., Maouche S<sup>1</sup>., Dorbath C<sup>2</sup>., Dorbath L<sup>2</sup>., Bezzeghoud M<sup>3</sup>**

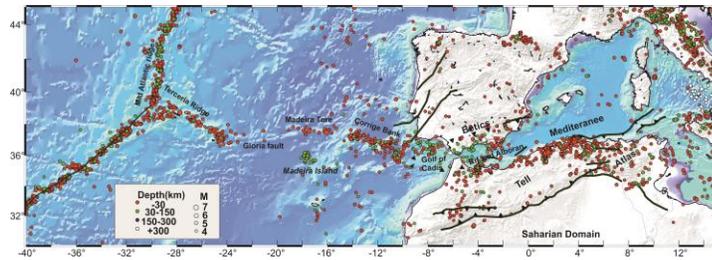
<sup>1</sup>CRAAG, BP63 Bouzaréah, Algiers, Algeria, f.ousadou@gmail.com.

<sup>2</sup>EOST, University of Strasbourg, France

<sup>3</sup>ECT-University of Evora, Portugal

The Africa-Eurasia plate boundary displays, a transition from simple deformation at the Azores triple junction in the Atlantic ocean to a complex and deformed zone in Atlas mountains in Morocco, Algeria and Tunisia. The plate boundary is well delimited from the Azores Islands, to Strait of Gibraltar and become diffuse in the Maghreb area. Although most earthquakes along this plate boundary are shallow and generally have magnitudes less than 5.5, many devastating earthquakes occurred in this region such those of: Mw 7.1, 08<sup>th</sup> May 1939 (Santa Maria Island), Mw 8.2, 25<sup>th</sup> November 1941 (mid-Atlantic ridge), Ms 8.0, 25<sup>th</sup> February 1969 (mid-Atlantic ridge), Mw 7.3, 10<sup>th</sup> October 1980, (El Asnam, Algeria); Mw 6.4 21<sup>st</sup> May 2003 (Zemmouri, Algeria) (Figure1) [1].

Most of the studies concluded to a convergence movement between the Africa and Eurasia in the NW-SE direction with anticlockwise rotation. Moreover, the general stress regime shows extension in the Azores region, right-lateral strike slip motion in the Gibraltar strait and Alboran Sea, and compression in the Maghreb Area[2].



The aim of this work is to present a new insight of the tectonic stress regime along the plate boundary zone derived from the orientation of principal stress axes ( $\sigma_1$ ;  $\sigma_2$ ,  $\sigma_3$ ) of the Western Mediterranean from the Azores to Tunisia plate boundary zone, calculated using focal mechanism parameters inversion.

In this study we have used Michael's method to invert our focal mechanisms [3]

Figure 1: seismicity of the western Mediterranean region.

### References:

- [1] Bezzeghoud M. et al., (2014) Seismicity along the Azores-Gibraltar region and global plate kinematics, *J. Seismol*, DOI: 10.1007/s10950-013-9416-x.
- [2] Ousadou F. et al., (2014) Stress field variations along the Maghreb region derived from inversion of major seismic crisis fault plan solutions, *Tectonophysics*. DOI:10.1016/j.tecto.2014.06.017.
- [3] Michael A. J. (1984), Determination of stress from slip data, faults and folds, *J. Geophys. Res.*, 89(B13):11517-11526.

