



## **Modelling the lithospheric rheology control on the Cretaceous rifting in West Antarctica**

Marco Bonini (1), Giacomo Corti (1), Chiara DelVentisette (2), Piero Manetti (1,2)

(1) Istituto di Geoscienze e Georisorse, Consiglio Nazionale delle Ricerche, Firenze, Italy, (2) Dipartimento di Scienze della Terra, Università degli Studi di Firenze, Firenze, Italy.

Small-scale physical models investigated the Cretaceous orthogonal extension in the West Antarctic Rift System. The models considered the transition from 4-layer strong cratonic lithosphere (East Antarctic Craton) to a more heterogenous, weaker 3-layer lithosphere. Sand and sand-silicone mixtures were used to reproduce brittle and ductile layers in the model lithosphere; the multilayered models were extended in a large capacity centrifuge at the Tectonic Modelling Lab of the CNR-IGG in Florence, Italy. The modelling results support previous hypotheses about the strong control exerted by lateral variations in lithospheric structures on the process of extension. Strain was mostly accommodated at the weak-strong lithospheres boundary, with a relative uplift of the cratonic block which remained essentially undeformed. Conversely, the weaker lithosphere showed wide-rifting style geometry, locally associated with core-complex-like structures. In agreement with the natural prototype, this tectonic scenario led to a long lasting extension without continental break-up, and to the absence of relevant surface magmatism but potential magma underplating.