Geophysical Research Abstracts
Vol. 17, EGU2015-5932, 2015
EGU General Assembly 2015

Thrust-wrench fault interference in a brittle medium: new insights from analogue modelling experiments

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We present analogue modelling experimental results concerning thrust-wrench fault interference in a brittle medium, to try to evaluate the influence exerted by different prescribed interference angles in the formation of morpho-structural interference fault patterns. All the experiments were conceived to simulate simultaneous reactivation of confining strike-slip and thrust faults defining a (corner) zone of interference, contrasting with previously reported discrete (time and space) superposition of alternating thrust and strike-slip events. Different interference angles of 60º, 90º and 120º were experimentally investigated by comparing the specific structural configurations obtained in each case. Results show that a deltoid-shaped morpho-structural pattern is consistently formed in the fault interference (corner) zone, exhibiting a specific geometry that is fundamentally determined by the different prescribed fault interference angle. Such angle determines the orientation of the displacement vector shear component along the main frontal thrust direction, determining different fault confinement conditions in each case, and imposing a complying geometry and kinematics of the interference deltoid structure. Model comparison with natural examples worldwide shows good geometric and kinematic similarity, pointing to the existence of matching underlying dynamic process.

Acknowledgments
This work was sponsored by the Fundação para a Ciência e a Tecnologia (FCT) through project MODELINK EXPL/GEO-GEO/0714/2013.