



EGUsphere, referee comment RC1
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Comment on egusphere-2022-1183

Timothy Schmid (Referee)

Referee comment on "Structural control of inherited salt structures during inversion of a domino basement-fault system from an analogue modelling approach" by Oriol Ferrer et al., EGU Sphere, <https://doi.org/10.5194/egusphere-2022-1183-RC1>, 2023

The manuscript by Ferrer et al. presents a series of analogue experiments that investigate an extensional domino-like basement fault system with a pre-tectonic unit under extension and subsequent inversion phase. The pre-tectonic unit, comprising a salt layer and an overburden (with different thickness ratio), acts as a mechanical discontinuity between basement-fault system and a syn-tectonic unit on top. The work provides a carefully laid out presentation of salt-related deformation structures and, the influence of the layer thickness ratio on the style of basin inversion. Thanks to a well-established workflow the authors present quantitative results that allow for a detailed discussion of the salt layer that conditions coupling between the basement-fault system and the overburden succession during inversion. While the extensional phase of the experiments has been previously described by the same authorship, the detailed investigation of the rift inversion part provides novel and original insights into coupling mechanisms and structural reactivation.

The manuscript appropriately reviews published work on the role of salt layers and their role during rift system inversion and introduces previous analogue modelling studies on basin inversion. The conducted models explore different thickness ratios between salt layer and overburden (i.e., the pre-tectonic unit) and test how this thickness ratio influences the style of extensional structures and their reactivation during subsequent inversion. The modelling results are presented based on central 2D cross-sections at final extensional stages and after the identical amount of shortening. These cross section show in great detail extensional structures and their role in the subsequent inversion, and highlight distinctive styles of basin inversion governed by the salt-overburden thickness ratio. This contribution seems well suited for EGU Solid Earth and the special issue Analogue modelling of basin inversion. The manuscript is original, overall well written and well organised. Illustrations are clear and concise and mostly guide the reader (see minor comments below). I would recommend accepting this manuscript after some minor to moderate revisions.

Please find my comments in the attached pdf file.

Please also note the supplement to this comment:

<https://egusphere.copernicus.org/preprints/2022/egusphere-2022-1183/egusphere-2022-1183-RC1-supplement.pdf>