Accepted Manuscript

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PII: S0191-8141(15)00031-0

DOI: 10.1016/j.jsg.2015.01.009

Reference: SG 3182

To appear in: *Journal of Structural Geology*

Received Date: 10 June 2014

Revised Date: 27 January 2015

Accepted Date: 28 January 2015

Please cite this article as: Dooley, T.P., Jackson, M.P.A., Jackson, C.A.-L., Hudec, M.R., Rodriguez, C.R., Enigmatic structures within salt walls of the Santos Basin—Part 2: Mechanical explanation from physical modeling, Journal of Structural Geology (2015), doi: 10.1016/j.jsg.2015.01.009.

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Enigmatic structures within salt walls of the Santos Basin—Part 2: Mechanical explanation from physical modeling

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Abstract

Jackson et al. (*this volume*) used 3D seismic reflection data to describe intrasalt deformation in salt walls in the Santos Basin. They focused on the origin of enigmatic allochthonous salt sheets of older evaporites (A1 unit) emplaced above overlying stratified evaporites (A2–A4 units). Their kinematic model incorporates: (i) initial inward flow and thickening of A1 salt within the rising wall, and arching of A2–A4 overburden; (ii) breaching of the arched overburden, ascent of mobile A1 evaporites along single or multiple feeders, and emplacement of upper-wall sheets or canopies; and (iii) a component of regional shortening within the salt. This companion paper uses physical modeling to explain how and why these structures occur and proposes a mechanical basis for the kinematic model. Our first two models simulated salt having uniform internal density, with walls growing by (i) initially symmetric differential loading and (ii) initially symmetric differential loading plus shortening. These models reproduced anticlines and injection folds seen in the simpler deformed walls in the Santos Basin. However, neither model

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