

12.04: Interaction between a rising salt wall and faulting of the wall roof

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ABSTRACT

We use an evolutionary finite-element model to simulate how a rising salt wall creates faults in its roof and how the faults affect stresses. The rise of the salt wall induces extension in the wall's roof leading to successive conjugate normal faults (Fig. 1). The least principal stresses in the roof increase after the roof faults and rotate to subnormal to the faults. Salt rises faster through the faulted roof, rotating normal faults into sub-horizontal and vertical faults. The least principal stress differs significantly across the horizontal fault; it is almost horizontal above the fault but vertical and greater by more than half below the fault (Fig. 2). Faulting substantially impacts the evolution of a salt wall and stresses around it.

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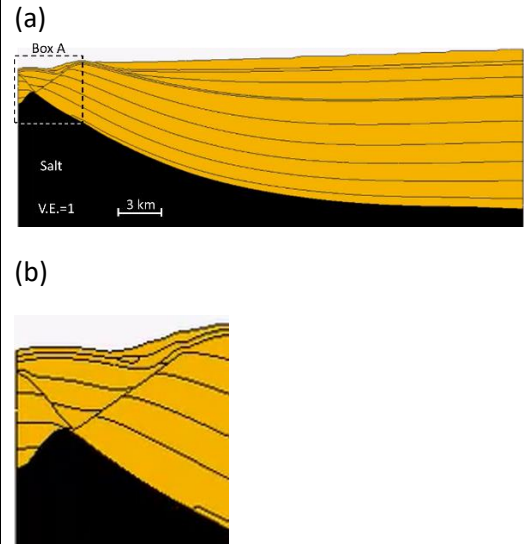


Fig 1: The salt wall rising and faulting its roof. Salt is black and sediments are yellow. (a) Entire model. (b) Salt-wall roof (Box A in a).

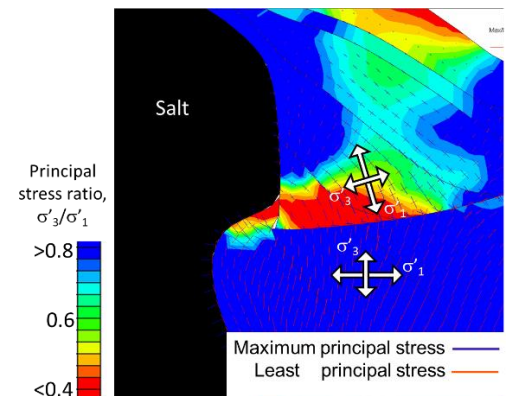
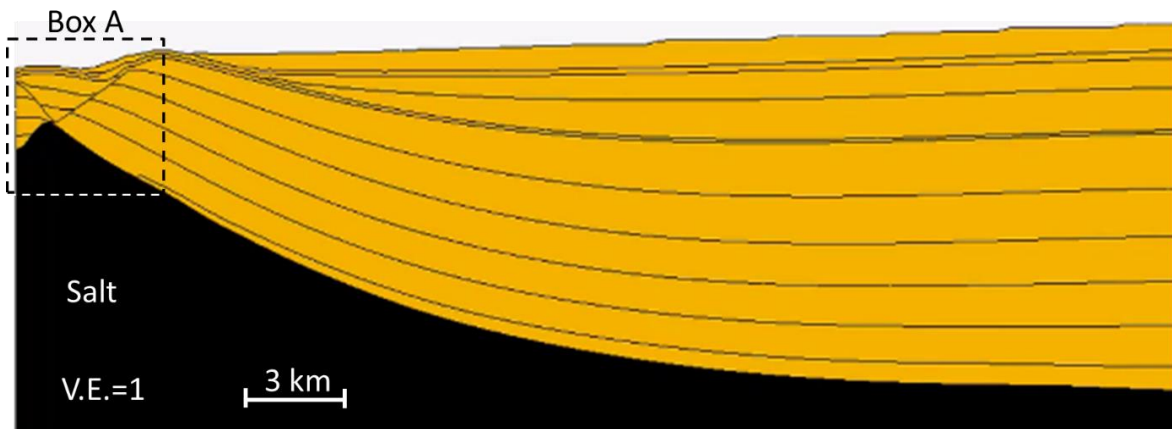


Fig 2: The least principal stress across a sub-horizontal fault. Contours show the ratio of least to maximum effective principal stress. Arrows and dashed lines show the orientation of these stresses.

(a)



(b)



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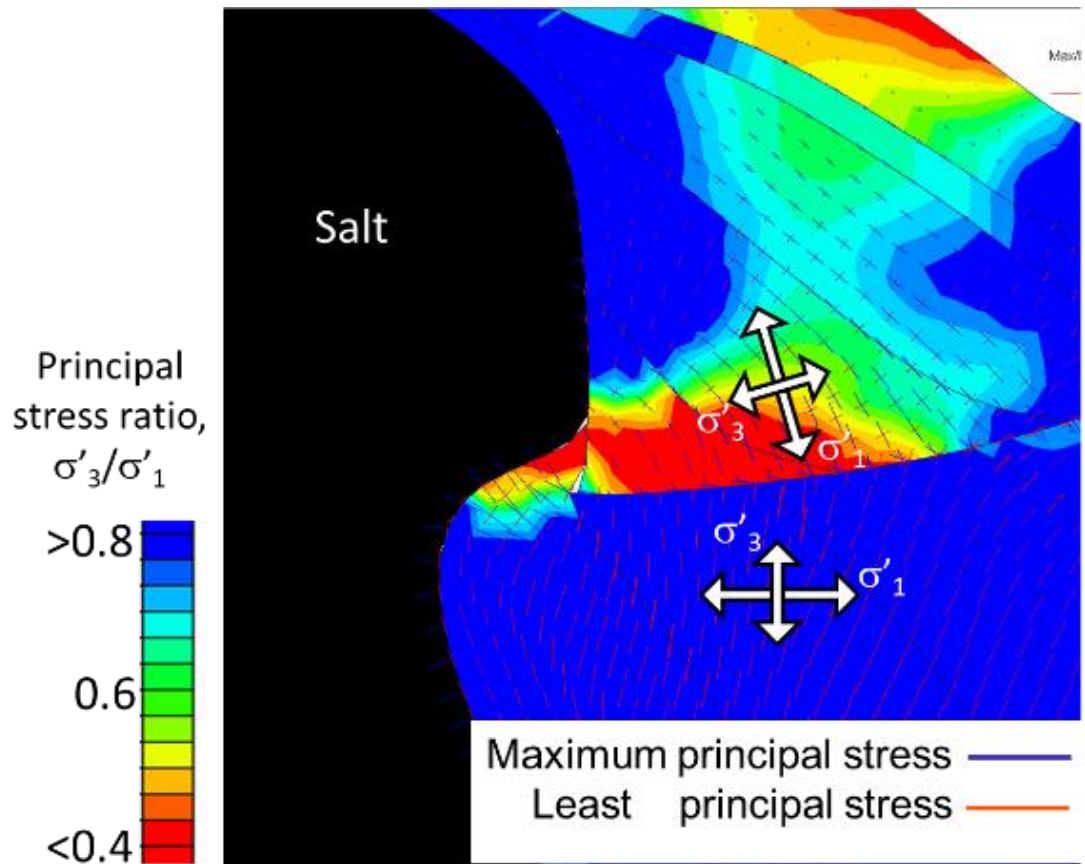


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