AAPG HEDBERG CONFERENCE
"Deformation, Fluid Flow and Reservoir Appraisal in Foreland Fold and Thrust Belts"
May 14-18, 2002, Palermo – Mondello (Sicily, Italy)

COMPRESSIONAL SALT TECTONICS IN NATURE AND EXPERIMENTS
Folding and thrusting above thick salt in Angola

Jean-Pierre BRUN and Xavier FORT
Geosciences Rennes UMR 6118 CNRS-University Rennes1 (France)

The deepest part of the Angolan margin undergoes, since 100 My, a gravity driven compression above Aptian salt as demonstrated by a large variety of compressional synsedimentary structures including folds with different wavelengths, thrust faults, and squeezed diapirs. They are either of purely compressional origin or result from inversion of earlier extensional structures. Laboratory scale models are used to study their progressive development as a function of the initial geometry of the salt basin, the synkinematic rate of sedimentation, and the basal slope angle. In both experiments and Angolan margin compression starts at a distance from the frontal salt wedge and later migrates downslope and upslope. The zone of initial compression gives rise to growth folds and thrusts. Experiments show that the amplification of initial folds evolves (1) into pinched synclines which can detach and become incorporated within salt and (2) into pinched anticlines which imprison salt leading to compressional diapirs. Within this zone of early compression, local non folded areas give pop-up type structures. Late upslope migration of compression is mostly characterized by squeezing of extensional diapirs. The results of laboratory modeling are applied to the seismic interpretation of the ultra deep area of the Angolan margin. Reflections observed in apparently massive salt areas, at the toe of the compressional domain, are tentatively interpreted in terms of sediments incorporated within salt by compressional deformation.