
The role of salt in mountain building, from minibasin formation to orogen dynamic

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Résumé

Evaporites levels have long been considered to have a major impact on the evolution of tectonically-driven as well as gravity-driven fold-and-thrust belts. If initially thin and planar, the role of pre-tectonic salt can be limited to an efficient décollement level during the convergence. Nevertheless, as a décollement level, pre-kinematic salt rock already deeply modifies the shape of the orogenic wedge, favouring large and low taper prisms. In addition, a thick pre-kinematic evaporite level, triggering salt tectonics from the time of the deposition on, modifies the architecture of the sedimentary packages and subordinate basins later incorporated within the orogenic wedge, creating structurally deceiving inherited geometries. Syn-orogenic salt levels also controls the fold-and-thrust belt development, favouring large scale decoupling and strain partitioning. At a much larger scale, it appears that salt levels influences also the development of the orogenic prism itself, modifying the topographical evolution of the taper. Examples from the Western Alps, the Pyrenees and the Sivas basin illustrate the various roles of salt, generating strong inheritance at almost all scales of observation. In addition, two dimensional numerical experiments of collision built by the inversion of rifted margins reveal that mechanically, a weak décollement layer formed by salt rocks delays the formation of the collisional orogen. The thicker the salt layer, the wider is the orogen and the lower the altitude of the mountain belt, leading to a quasi-absence of topography and widespread salt tectonics, which obliterates classical thrusts propagation.

Mots-Clés: Salt tectonics, inheritance, fold and thrust belt, diapir, minibasin

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