Laboratory Models of Subduction: State of the Art

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The use of experimental tectonics to study tectonic processes is not a novelty in Earth Science. Following *Sir James Hall*'s pioneer work (1815), many modellers squeezed, stretched and pushed inexpensive materials like sand, clay, oil, painters's putties, gelatins, wax, paraffin, syrups and chocolate to simulate geological structures present in nature with the aim to determine parameters that control their origin, development and final geometry. However only recently the experimental analogue modeling had been advanced considerably. Thanks to the proper scaling relationships and the improvement in the knowledge of the rheology of both natural and model materials, experimental tectonics is proving to be a useful and relatively cheap technique to study tectonic processes. Experimental tectonics has examples both in large-scale geodynamic applications (subduction, evolution of thrust belts, formation of basins, pluton emplacement, mantle and crustal convection) and in smaller scale structural geology (faults, folds, diapirism, boudinage).

To illustrate what is a laboratory model, the information can be extracted from and how they can be applied to natural system I will try to review the experimental works performed in the last decades in laboratory to reproduce one of the most intriguing aspect of the Plate Tectonics: the subduction process. In particular, it will be illustrated how has been experimentally studied the "life" of a slab, from its birth to the interaction with the 660 km discontinuity at depth. highlighting differences between kinematically prescribed and dynamically self-consistent models, 2D-like and 3D models and, weak- and stiff slab models.