# Modeling the subduction process using 3D laboratory and numerical tools

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Laboratory and numerical models of the subduction process can provide a detailed and complementary description of the subducting lithosphere behavior. Laboratory models yield naturally a three-dimensional reproduction of compositional layering, and brittle process such a faulting and fractioning. Moreover, the research of materials with temperature-dependent viscosity reproducing the Newtonian and visco-elastic properties of subducting plate could lead to a more exact description of subducting process and to get over the limitations of the previous analogue models. Numerical models offer a means to study complex large scale processes such a phase transition, power-law rheology or temperature-dependent viscosity and buoyancy and allow for extensive and reproducible parameter studies. We present the preliminary results obtained combining the two methods, through the application of analogue material to study the subduction process with temperature dependent viscosity and density and dynamical full three-dimension numerical models performed with the finite element code Citcom, solving the equations for conservation of mass, momentum, composition and energy for an incompressible viscous Cartesian box. Besides, our first calibrations of the new materials allows us to make a preliminary restriction of the material research field on the basis of the suitable Earth's parameters scaling.