



## **Multiphase geodynamical modelling using Aspect**

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Aspect (Advanced Solver for Problems in Earth's ConvecTion) is a 2D/3D FEM code to simulate problems in thermal convection. It is a promising and powerful tool, implementing state-of-the-art numerical methods and is vowed to become a standard tool in the mantle convection numerical modelling community.

Its primary focus is on the simulation of processes in the earth's mantle, but its design is more general than that and we therefore explore the (recent) algorithmic additions made to the code: these include for instance the ability to implement complex in/outflow boundary conditions, the tracking of any number of compositional fields which are passively advected by the computed velocity fields, and the use of various adaptive mesh refinement strategies. Several benchmarks of the geodynamical community involving multiphase flow will be shown and compared with results obtained with a FEM code using the particle-in-cell technique and a FEM code using the level set method. The use of Aspect in the case when a free surface is present will also be investigated.