Modelling of CO₂ Sequestration and Numerical Simulation

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Abstract: In this presentation we develop mathematical models for describing different scenarios of CO_2 sequestration, numerical implementation and simulations. Such models have to describe the propagation of phases in all media including fissured rocks and free flows. The goals are to predict possible leakage sources of CO_2 , to estimate the expected storage capacity for CO_2 repositories and to optimize injection process to improve the deposition quality. We have developed a general multiphase flow model based on Navier-Stokes equations and apply modern numerical techniques such as discontinuous and mixed finite elements for simulating the sequestration process including phase transitions.

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