Insalate di Matematica

presents

How not to blow up the Earth

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U5 - Room 3014 and
Webex meeting
Università di Milano Bicocca

Abstract

Carbon dioxide (CO_2) is the primary greenhouse gas emitted through human activities and causing global warming. Carbon Capture and Sequestration (CCS) is a relatively new technique designed to reduce the amount of atmospheric CO_2, and it aims at injecting this pollutant into deep geological structures. For this reason, it is fundamental to be able to simulate the long-time behaviour of fluid mixtures containing CO_2 once stored.

In this talk, we detail a mathematical model describing the flow of these mixtures inside a porous medium. The equations in this model form a system of fully-coupled non-linear PDEs, which cannot be analytically solved. We then review some numerical methods able to recreate these dynamics and highlight the improvements achieved throughout the last decades.

Keywords:

multi-phase fluid flow · porous media · finite volume · discontinuous galerkin

"Obvious" is the most dangerous word in mathematics. - Eric Temple Bell

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