

Abstract Submitted
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Self-similarity in porous convection ANJA SLIM, Monash University

— In geological carbon storage, the carbon dioxide injected into a saline formation is less dense than the resident brine and floats above it. However it is also slightly soluble in brine and progressively dissolves. Brine with dissolved CO_2 is slightly denser than “pure” brine and there is the potential for convective overturning. The form of this convection changes as more and more CO_2 dissolves, but eventually a surprising regime is reached in which the rate at which CO_2 dissolves is constant. In this regime, we find that there is no characteristic length-scale and the horizontally averaged concentration field is self-similar. I will describe features of this regime and develop a system of almost-complete effective equations that describe its evolution.

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