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Johnny Corbino* (jcorbino@mail.sdsu.edu), 5500 Campanile Drive, GMCS bldg,
Computational Science Research Center, San Diego, CA 92182. *SubFlow: Modeling Geological
Sequestration of Carbon Dioxide with Mimetic Discretization Methods.*

We introduce a reliable software package to simulate the long-term storage of CO₂ injected into geological formations. Depleted oil fields and subsurface saline aquifers are examples of this type of formations. Our software (SubFlow) considers all the required parameters to predict whether a preselected injection site is in fact suitable for CO₂ sequestration. SubFlow is an open-source, sustainable, and reliable software element that allows its users to model the transport of reactive chemical compounds (CO₂, H₂S, etc.) in porous media. What makes SubFlow different from the rest is its numerical core (the module that solves the problem's governing equations). In our software, we use a novel numerical approach to solve the main partial differential equations (PDE) that governs the migration of reactive compounds in porous media at typical injection depths. We use mimetic discretization methods (MDM) to attain higher-order accurate simulations without compromising the physical constraints inherent to the problem. For this type of problem, MDM have proven to be a versatile and competitive alternative to the widely used standard finite-difference (FDM) and finite element (FEM) methods. (Received September 25, 2017)