1135-86-2724 **Kyle Campbell*** (`kjcampbell@sdsu.edu`), San Diego State University, 5500 Campanile Drive, San Diego, CA 92182-1326, and **Christopher Paolini** (`paolini@engineering.sdsu.edu`) and **Jose Castillo** (`jcastillo@mail.sdsu.edu`). *Modeling Multiphase Buoyancy Driven Plume Migration during Geologic CO2 Injection.*

A Department of Energy geologic carbon sequestration site selection goal is to ensure, through numerical modeling and simulation that no more than 1% of injected CO2 escape within 1000 years after injection. To predict long-term retention of CO2 in a reservoir, the interaction of geochemical and geomechanical effects of injection must be modeled. The transport of gas phase CO2 through microfractures, at the 100-micrometer scale, in porous sandstone and shale could lead to unwanted release of CO2 back into the atmosphere. We model the buoyancy driven flow of a two-phase system consisting of a CO2-H2O vapor mixture phase, and an aqueous phase, composed of formation water, dissolved CO2, and charged solutes formed from mineral dissolution. This two-phase system forms a plume of gaseous and aqueous CO2 that can migrate upward due to differences in density between CO2-rich phases and the surrounding formation fluid. We model the gas phase CO2-H2O composition using a Redlich and Kwong equation of state (EOS) with mixing rules, and the aqueous phase composition using the revised Helgeson Kirkham Flowers model for approximating thermodynamic properties of aqueous electrolytic solutions at high temperatures and pressures. Pitzer equations are used to compute solute activity coefficients. (Received September 26, 2017)