1145-35-2901 **Elisabeth MM Brown*** (embrown5@ncsu.edu) and **Michael Shearer**. *A Scalar Conservation Law for Plume Migration in Carbon Sequestration.*

A quasi-linear hyperbolic partial differential equation with a discontinuous flux models geologic carbon dioxide (CO_2) migration and storage. Two flux functions characterize the model, giving rise to flux discontinuities. One convex flux describes the invasion of the plume into pore space, and the other captures the flow as the plume leaves CO_2 bubbles behind, which are then trapped in the pore space. We investigate the method of characteristics, the structure of shock and rarefaction waves, and the result of binary wave interactions. The dual flux property introduces unexpected differences between the structure of these solutions and those of a scalar conservation law with a convex flux. During our analysis, we introduce a new construction of cross-hatch characteristics in regions of the space-time plane where the solution is constant, and there are two characteristic speeds. This construction is used to generalize the notion of the Lax entropy condition for admissible shocks, and is crucial to continuing the propagation of a shock wave if its speed becomes characteristic. (Received September 25, 2018)