

## **Entropy-dissipative discretizations of the porous medium equation**

We prove that the discretization of the porous medium equation by way of an implicit Euler finite-volume approximation preserves the entropy dissipative characteristics of the underlying continuous equation.

Polynomial as well as exponential decay of zeroth-order entropies is shown for a large range of parameters using discrete generalized Beckner inequalities. In addition we can provide a proof for exponential decay of some first-order entropies by means of a convexity argument with respect to the time step parameter.