

1116-VB-2873      **Tucker Hartland, Petronela Radu and Ravi Shankar\*** (rshankar@mail.csuchico.edu).

*Some results on nonlocal nonlinear diffusion equations.*

We consider a class of nonlocal nonlinear diffusion equations (NNDEs). We present several new qualitative results for nonlocal Dirichlet problems on bounded domains. It is shown that solutions with positive initial data remain positive through time, even for nonlinear problems; in addition, we prove that solutions to these equations obey a strong maximum principle. A striking result shows that nonlocal solutions must have some irregularity at the boundary; otherwise, we have ill-posedness of the initial value problem. (Received September 22, 2015)