

Meeting: 1005, Newark, Delaware, SS 13A, Special Session on Integral and Operator Equations

1005-45-208 **Charles W. Groetsch*** (groetsch@math.uc.edu), University of Cincinnati, and **Donald A. French**, University of Cincinnati. *A nonlinear integral equation for modeling ion channel distributions in olfactory cilia.* Preliminary report.

A pair of nonlinear partial differential equations lead to a nonlinear integral equation of the first kind that is proposed to model experiments aimed at identifying gross features of the distribution of ion channels along cilia that extend from olfactory receptor neurons. A simple numerical method, based on a fine-grid finite difference scheme for the pdes and a course-grid discretization of the integral equation, is derived and used to obtain estimates of the spatial distribution of ion channels along the length of the cilium. Simulations using experimental data indicate that these channels have a non-uniform distribution. (Received February 14, 2005)