“A nonlinear Helmholtz problem: a ‘failure’ of critical point theory”

We consider a class of boundary value problems for a nonlinear Helmholtz equation that may not admit $H_1$ solutions. Solutions of regularized problems are found by application of the saddle point lemma. These approximations may blow up in the limit of the true problem, but if so the variational formulation provides information on the form of the blow-up. One form of regularization appears capable of finding weak ($L_p$) solutions \textit{a posteriori} even when the approximations fail to converge in $H_1$.

Graduate students are invited to attend.

For questions, comments, and offers to talk, contact Steve Schecter, schecter@math.ncsu.edu. Please visit the DE Seminar web page at www.math.ncsu.edu/seminars.html.