

1032-35-180

Sarah Raynor* (raynorsg@wfu.edu), Department of Mathematics, Wake Forest University, P.O. Box 7388, Winston Salem, NC 27109. *Nonvariational Methods for Semilinear Elliptic Equations of Critical Growth.*

This talk is joint work with M. Chhetri, P. Drabek, and S. Robinson. We study nonlinear elliptic equations of the type

$$\Delta u - \vec{c} \cdot \nabla u = \lambda u + g(x, \lambda)|u|^{p-2}u \quad (1)$$

where \vec{c} is a constant vector, g is a bounded, continuous function, and p is the critical Sobolev exponent $\frac{2N}{N-2}$, where $N \geq 3$ is the dimension. The main techniques for proving existence of solutions have been topological. However, due to the nature of the nonlinearity, the corresponding operator is not compact and Leray-Schauder degree theory does not apply. In this talk, I will discuss the methods of concentration compactness, as developed by P.L.Lions, the (S_+) degree theory of Skrypnik, and how these new techniques can be used to prove existence for Equation 1. (Received August 21, 2007)