Leggett-Williams theorems for coincidences

Donal O'Regan, Mirosława Zima

We discuss the existence of positive solutions to the coincidence equation $Lx = Nx$, where L is a linear Fredholm mapping of index zero and N is (in general) a nonlinear operator. Using the properties of cones in Banach spaces and Leray-Schauder degree we obtain some refinements of the results established in [1] and [3]. Some applications to the periodic problem for first order differential equation will also be given. We present some results from [2].

1. R. E. Gaines, J. Santanilla , A coincidence theorem in convex sets with applications to periodic solutions of ordinary differential equations, Rocky Mountain J. Math. 12 (1982), 669–678

2. D. O'Regan, M. Zima, Leggett-Williams norm-type theorems for coincidences, Archiv der Mathematik, to appear

3. J. Santanilla, Some coincidence theorems in wedges, cones, and convex sets, J. Math. Anal. Appl. 105 (1985), 357–371