Abstract- Talk Title - Elliptic Variational Inequalities of the Second Kind

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Variational inequalities are, generally speaking, inequalities involving a functional that have to be solved over some set, usually one that is convex. Variational inequalities serve as models for various physical processes and have application to areas including math modeling, optimization, and PDE. In this talk, we will focus on Elliptic Variational Inequalities (EVIs) of the first and second kind. We will begin by briefly introducing the relevant theory of ordered vector spaces and how this theory is used to establish existence of solutions to second kind problems. Second kind EVIs contain non-linear and discontinuous terms not present in first kind EVIs, which makes extending results from first kind problems to second kind problems difficult in some cases. We will outline some of the types of results known for first kind problems that we wish to extend to second kind problems. In particular, we will discuss the mathematical challenges in extending results from first kind problems to second kind problems, and some of the sufficient additional conditions used to attain desired results for second kind EVIs.