E. Tarafdar, P. Watson, Xian-Zhi Yuan Random coincidence degree theory with applications to random differential inclusions

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Abstract: The aim of this paper is to establish a random coincidence degree theory. This degree theory possesses all the usual properties of the deterministic degree theory such as existence of solutions, excision and Borsuk's odd mapping theorem. Our degree theory provides a method for proving the existence of random solutions of the equation $Lx \in N(\omega, x)$ where $L : \text{dom} L \subset X \to Z$ is a linear Fredholm mapping of index zero and $N : \Omega \times \overline{G} \to 2^Z$ is a noncompact Carathéodory mapping. Applications to random differential inclusions are also considered.

Keywords: Carathéodory upper semicontinuous, random (stochastic) topological degree, Souslin family, measurable space AMS Subject Classification: Primary 47H04, 54C60; Secondary 52A07