

Abstract Submitted  
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**Stochastic Non-Resistive Magnetohydrodynamic System with Lévy Noise**<sup>1</sup> MANIL T. MOHAN, SIVAGURU S. SRITHARAN , Air Force Inst of Tech - WPAFB, UTPAL MANNA, Indian Institute of Science Education and Reserach, Thiruvananthapuram — The incompressible, viscous and resistive magnetohydrodynamic (MHD) system consists of the Navier-Stokes equations coupled with the Maxwell equations. MHD has many applications in various fields ranging from Astrophysics to nuclear fusion devices. When the magnetic diffusivity is taken to be zero, we get the incompressible, viscous and non-resistive MHD equations. In this work, we consider the incompressible, viscous and non-resistive MHD equations with Lévy noise in two and three dimensions. We prove the local in time existence and uniqueness (path wise) strong solution to the stochastic non-resistive MHD system up to a maximal stopping time. For proving this, we first consider a class of bounded solutions with finite higher order energy in space variable and prove the solutions of the smoothed version of the stochastic MHD system exist. We find a collection of positive stopping times on which the norms of the smoothed version solution are uniformly bounded. For any stopping time from this collection, the smoothed version solution is a Cauchy sequence and hence is convergent. An application of Sobolev interpolation results and Banach-Alaoglu theorem yield the existence of local in time strong solution. We finally show that this local strong solution is path wise unique.

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