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3D Hall Evolution of Magnetic Fields in Neutron Stars

Tuesday 26 April 2016 15:40 (20 minutes)

We have recently developed a 3D numerical model to evolve the Hall-Ohmic magnetic field in neutron stars (NSs). Our model is an important extension to the state-of-the-art 2D magneto-thermal model of Pons+ (2007, 2009), Vigano+ (2012, 2013). We have now validated and benchmarked our new 3D model, and we are beginning to investigate how Hall-driven evolution in 3D compares to the known evolutionary picture in 2D. I provide an overview of our numerical scheme, its suitability for different magnetic configurations, and discuss 3D magnetic decay and evolution in several important physical limits. I also outline the trajectory for future numerical experiments, and how cross-coupling with other codes will invite exciting, next generation research into NS physics and evolution.

Presenter: Dr ELFRITZ, Justin

Session Classification: Afternoon session