Lorenzo Riva* (lri07661@creighton.edu), 2500 California Plaza, Creighton University, Davis Hall, Omaha, NE 68178. *Low Regularity Non-$L^2(\mathbb{R}^n)$ Local Solutions to the gMHD-$\alpha$ system.

The Magneto-Hydrodynamic (MHD) system of equations governs viscous fluids subject to a magnetic field and is derived via a coupling of the Navier-Stokes equations and Maxwell’s equations. It has recently become common to study generalizations of fluids-based differential equations. Here we consider the generalized Magneto-Hydrodynamic alpha (gMHD-$\alpha$) system, which differs from the original MHD system by the presence of additional non-linear terms (indexed by the choice of $\alpha$) and replacing the Laplace operators in the equations by more general Fourier multipliers with symbols of the form $-|\xi|^\gamma / g(|\xi|)$. In a paper by Pennington the author considered the problem with initial data in Sobolev spaces of the form $H^{s,2}(\mathbb{R}^n)$ with $n \geq 3$. Here we consider the problem with initial data in $H^{s,p}(\mathbb{R}^n)$ with $n \geq 3$ and $p > 2$, with the goal of minimizing the regularity required to obtain unique existence results. (Received September 04, 2019)