

1152-35-183

Chenyun Luo*, 1326 Stevenson Center, Nashville, TN 37240, and **Junyan Zhang**, 404 Krieger Hall, 3400 N. Charles St, Baltimore, MD 21218. *Free-boundary MHD equations with surface tension.*

We consider the three-dimensional incompressible free-boundary magnetohydrodynamics (MHD) equations in a bounded domain with surface tension on the boundary. We establish a priori estimate for solutions in the Lagrangian coordinates with $H^{3.5}$ regularity. To the best of our knowledge, this is the first result focusing on the incompressible ideal free-boundary MHD equations with surface tension. It is worth pointing out that the $1/2$ -extra spatial regularity for the flow map η is no longer required in this manuscript thanks to the presence of the surface tension on the boundary. (Received September 03, 2019)