

A necessary condition for the vanishing singularity in a suitable weak solution of the MHD equations

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Abstract

We explain what we mean by the vanishing singularity. Then we show that if $(\mathbf{x}_0, T)$ is a vanishing singularity in a suitable weak solution $(\mathbf{u}, \mathbf{b})$ of the MHD equations in a 3D domain Ω , where $\mathbf{u}$ is the velocity and $\mathbf{b}$ is the magnetic field, then

$$\lim_{t \rightarrow T-} (\|\mathbf{u}(\cdot, t)\|_{\xi; B_R(\mathbf{x}_0)} + \|\mathbf{b}(\cdot, t)\|_{\xi; B_R(\mathbf{x}_0)}) (T - t)^{\frac{\xi-3}{2\xi}} = \infty$$

for any $\xi \in [3, 6]$ and $R > 0$.

Keywords: MHD equations, weak solution, regularity

References

- [1] J.Neustupa, M.Yang, *A Necessary Condition for a Vanishing Singularity in a Suitable Weak Solution to the Navier–Stokes Equations*, Preprint 2025.