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| | **abstract** | In this paper we exclude the scenario of apparition of finite time singularity in the form of self-similar singularities in the ideal magnetohydrodynamic equations, assuming suitable integrability conditions on the vorticity and the magnetic field. We also consider more sophisticated possibility of asymptotically self-similar singularities, which means that the local classical solution converges to the self-similar profile as we approaches to the possible time of singularity. The scenario of asymptotically self-similar singularity is also excluded under suitable conditions on the profile. In the 2D magnetohydrodynamics the magnetic field evolution equations reduce to a divergence free transport equation for a scalar stream function. This helps us to improve the above nonexistence theorems on the self-similar singularities, in the sense that we only need weaker integrability conditions on the profile to prove the results. | **abstract** | In this paper we exclude the scenario of apparition of finite time singularity in the form of self-similar singularities in the ideal magnetohydrodynamic equations, assuming suitable integrability conditions on the vorticity and the magnetic field. We also consider more sophisticated possibility of asymptotically self-similar singularities, which means that the local classical solution converges to the self-similar profile as we approaches to the possible time of singularity. The scenario of asymptotically self-similar singularity is also excluded under suitable conditions on the profile. In the 2D magnetohydrodynamics the magnetic field evolution equations reduce to a divergence free transport equation for a scalar stream function. This helps us to improve the above nonexistence theorems on the self-similar singularities, in the sense that we only need weaker integrability conditions on the profile to prove the results. | | |
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