

Explosive Singularity Formation in MHD

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Some of the most dramatic events in nature are large scale disruptions of plasmas such as solar flares, magnetospheric substorms and tokamak disruptions. For all these examples the speed of disruption suggests that an explosive mechanism is responsible. I will discuss a particular mechanism for the explosive release of energy in a plasma [1] and I will show experimental evidence for its role in the abrupt termination of tokamak plasmas. At the heart of our mechanism is a finite time singularity. I will discuss the connection between finite time singularities and explosive instabilities.

References

- [1] S. C. Cowley and M. Artun, Phys. Rep. 283, 185 (1997).