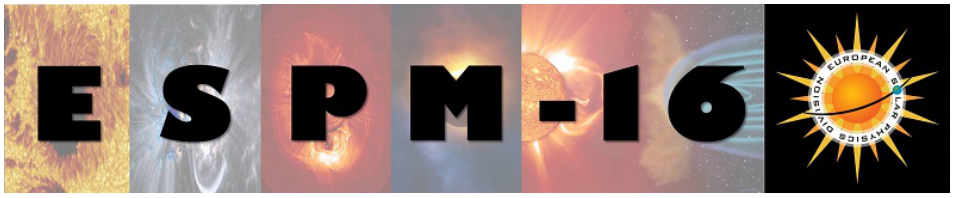

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Two-fluid simulations of Rayleigh-Taylor instability in a magnetized solar prominence thread: Magnetic structure formation

Thursday, 9 September 2021 11:26 (13 minutes)

We describe turbulent magnetic structure formation via driven magnetic reconnection in the non-linear phase of a Rayleigh-Taylor Instability (RTI) in a solar prominence supported by sheared magnetic field. Solar prominences are formed by partially ionized plasma with inter-particle collision frequencies generally warranting magnetohydrodynamic treatment. In this work, we explore the dynamical impacts and observable signatures of two-fluid effects in the parameter regimes when ion-neutral collisions do not fully couple the neutral and charged fluids [Ref. 1]. We perform 2.5D two-fluid (charges - neutrals) RTI simulations at a smoothly changing interface between a solar prominence thread and the corona. The purpose of this study is to deepen our understanding of the RTI and the effects of the partial ionization on the development of RTI using non-linear two-fluid numerical simulations.

[Ref. 1] Popescu Braileanu et al., A&A (2021a,b): doi.org/10.1051/0004-6361/202039053 ; doi.org/10.1051/0004-6361/202140425

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*Any opinion, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Student poster?

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