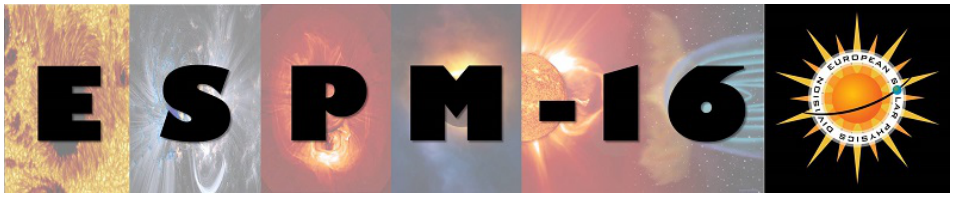

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Slow magnetoacoustic waves in gravitationally stratified two-fluid plasmas in strongly ionized limit

Wednesday, 8 September 2021 11:00 (13 minutes)

The plasma dynamics at frequencies comparable with collisional frequency between various species has to be described in multifluid framework, where collisional interaction between particles is an important ingredient. In our study, we will assume that charged particles are strongly coupled, meaning that they form a single fluid that interacts with neutrals, therefore we will employ a two-fluid model. Here, we aim to investigate the evolutionary equation of slow sausage waves propagating in a gravitationally stratified flux tube in the two-fluid solar atmosphere in a strongly ionized limit using an initial value analysis. Due to the collisional interaction between massive particles (ions and neutrals), the governing equations are coupled. Solutions are sought in the strongly ionized limit and the density ratio between neutrals and charged particles is a small parameter. This limit is relevant to the upper part of the chromosphere. Our results show that slow sausage waves associated with charged particles propagate such that their possible frequency is affected by a cut-off due to the gravitational stratification. In contrast, for neutral acoustic waves the cut-off value applies on their wavelength and only small wavelength waves are able to propagate. Slow modes associated with neutrals are driven by the collisional coupling with ions.

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