

## Ion-acoustic waves triggered by left-hand polarized finite-amplitude waves propagating in the beam direction

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Nonlinear ion-acoustic like waves triggered by large-amplitude circularly polarized waves propagating in the direction of a proton beam are studied. The properties are strongly dependent on the nature of the large-amplitude wave. Waves belonging to the Alfvén branch of the dispersion relation require much larger amplitude values to excite the ion-acoustic waves than those belonging to the beam branch of the dispersion relation. The former can trigger only forward propagating waves and always above a wave number threshold, while the latter can destabilize forward as well as backward propagating waves with a zero wave number threshold. It is shown that in some cases the unstable frequency spectrum is very narrow, and damping rates are very small even under conditions where the linear theory predicts strong Landau damping. It is conjectured that these type of waves might be of common occurrence in the fast solar wind, preferably closer to the Sun. These results are consistent with observa