



The Study of Collisional Phase Shifts and Dust Acoustic Rogue Waves in Polarized Dusty Plasma

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Dust is an ubiquitous component of space and astrophysical environments and has a wide range of applications in the different fields as well as in the study of astrophysical and space environments. Most of the space and astrophysical observations revealed the presence of non-Maxwellian distribution of particles in different plasma environments. The interaction between ions/electrons and highly negatively charged dust grains is termed as polarization force, which is an important frontline area of research in dusty plasma from last few decades. It is interesting to study the head-on collision (HOC) and rogue waves in a polarized dusty plasma. HOC between two dust acoustic solitary waves (DASWs) travelling in opposite directions in a dusty plasma with charged particles featuring non-Maxwellian distribution under the effect of polarization force is investigated by employing extended Poincaré-Lighthill-Kuo method. The collisional phase shift after HOC of two DASWs in a polarized dusty plasma is derived. This analysis shows that dusty plasma system admits a solution of two rarefactive solitary waves, one is moving to right and other is moving to the left, which is small amplitude limit in the respective reference frames. The polarization force has emphatic influence on rogon profile. It is emphasized that the real implementation of our present results is in different regions of space and astrophysical environments.