

Abstract Submitted  
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**The dynamics of electron and ion holes in electron-ion plasmas**

BENGT ELIASSON, PADMA KANT SHUKLA, Ruhr-University Bochum — We present analytical and numerical studies of the dynamics of nonrelativistic electron and ion holes in collisionless plasmas. The new results are based on a class of analytic solutions, which work as initial conditions to numerical simulations of the dynamics of ion and electron holes and their interaction with radiation and the background plasma. Our analytic and numerical studies reveal that ion holes can work as a resonance cavity which can trap Langmuir waves, due the local electron density depletion associated with the negative ion hole potential. Our study of the dynamics between electron holes and the ion background reveals that standing electron holes can be accelerated by the self-created ion cavity owing to the positive electron hole potential. The results of our simulations could be helpful to understand the nonlinear dynamics of electron and ion holes in space and laboratory plasmas.

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