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## Polarity switches, coexistence and the existence of supersolitons pertaining to electron-acoustic nonlinear structures

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Large amplitude electron-acoustic solitons are revisited in order to gain insights into why the phenomena of polarity switches, coexistence as well as the existence of supersolitons have been widely reported for ion-acoustic and dust-acoustic nonlinear structures but much less frequently for high frequency (electron-acoustic) nonlinear fluctuations associated with electron dynamics. The effect of streaming (warm) electrons is considered to determine to what extent is a beam responsible for supporting a switch in polarity from negative to positive polarity electron-acoustic solitons. Our results demonstrate that coexistence of negative and positive polarity electron-acoustic solitons and the existence of supersolitons of the electron-acoustic type are not easily amenable to models in which the positive species constituents are only protons. Consequently, we do not restrict our study to considering multi-temperature electron models containing only protons but models which are composed of protons and (much lighter therefore more mobile) positrons are also investigated.

**Apply to be considered for a student award (Yes / No)?**

No

**Level for award (Hons, MSc, PhD, N/A)?**

N/A

**Main supervisor (name and email) and his / her institution**

N/A

**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

No

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