

# Dust acoustic in dusty plasmas with electrons, variable dust charge and nonthermal ions

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**Abstract.** We study the nonlinear waves in dusty plasmas with variable dust charge, Boltzmann distributed electrons and the non-thermal ions. It is shown that amplitude of solitary waves of Kadomtsev-Petviashvili equation becomes diverges at the critical density. We derive solitons of modified KP equation with finite amplitude in this situation. A solitonic solution for the KP equation can not be found when the nonlinear term of KP equation becomes zero. But in this case the KP equation changes to modified type of the KP equation. The mKP equation has stable solitonic solutions where the KP equation has not. The effects of non-thermal ions, relative density, and relative temperature on the behaviour of the solitons have been discussed.

**Keywords:** dust, nonthermal, soliton

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## REFERENCES

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