



Aspect dependence of Langmuir Parametric Instability observed in the ionospheric modification

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Recent studies of X-mode wave heating experiments observed by EISCAT (European Incoherent Scatter Scientific Association) UHF radar indicate that parametric instability (PI) can be excited unexpectedly. In this paper, we reinvestigate the ionospheric heating experiment on 21 and 22 October 2012 in details. The observed HF-enhanced ion lines (HFILs) and HF-enhanced plasma lines (HFPLs) observed during the experiments present dependence on the heating incidence angles. The observational evidence and numerical calculation that the parallel electric field of X-mode heating wave can exceed the PI excitation threshold at certain angles indicate the decisive role of parallel electric field for the PI excitation. The excited HFPLs and HFILs during X-mode heating cycles also present the evidence for the non-Maxwellian distribution of the electrons in the heated region.