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ABSTRACT

I, have developed a model on Role of Dust Grains in parametric coupling of a lower hybrid pump wave with neutral beam driven ion-cyclotron instability in a tokomak. I, have found that the growth rate of mode increases with the relative density of dust grains δ and dust grain density n_{d0r} . It has also been observed that the growth rate increases with reducing the dust grain size a .

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NOTATIONS

$-e$	=	electron charge
m	=	mass of electrons
m_i	=	mass of ion
m_d	=	mass of dust
ϕ_0	=	electrostatic potential of lower hybrid pump wave
ϕ	=	parametric couple to an ion cyclotron mode with potential
ϕ_2	=	electrostatic potential of upper side band mode
ϕ_{pr}	=	pondermotive potential
E	=	normalized electric field
ω_0	=	angular frequency of lower hybrid pump wave
ω	=	angular frequency of parametric couple to an ion cyclotron mode
ω_1	=	angular frequency of lower sideband mode
ω_2	=	angular frequency of upper sideband mode
ω_{cr}	=	electron cyclotron frequency
ω_{cir}	=	ion cyclotron frequency
ω_{pr}	=	electron phase frequency
ω_{pir}	=	ion phase frequency
ω_{dr}	=	dust phase frequency
n_{er}	=	electron density distribution
n_{ir}	=	ion density distribution
n_{br}	=	beam density distribution
n_0	=	plasma density
c	=	speed of light
ϵ_0	=	free space permittivity
ϵ	=	parametric couple mode permittivity in presence of dust

ε_2	=	upper sideband mode permittivity
X_{er}	=	electron susceptibility
X_{ir}	=	ion susceptibility
X_{br}	=	beam susceptibility
X_{dr}	=	dust susceptibility
V_{ther}	=	thermal velocity of electrons
V_{thir}	=	thermal velocity of ion
C_{sr}	=	thermal velocity of speed of light
F_{pz}	=	pondermotive force
μ_r	=	coupling coefficient
δ	=	relative density of dust grains