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Influence of wake potential on the propagation of the space-charge wave in a waveguide dusty plasma[1] YOUNG-DAE JUNG, MYOUNG-JAE LEE, KYU-SUN CHUNG, Hanyang University — The wake potential effects on the propagation of the space-charge dust ion-acoustic wave are investigated in a cylindrically bounded dusty plasma with the ion flow. The results show that the wake potential would generate the double frequency modes in a cylindrically bounded dusty plasma. It is found that the positive mode of the wave frequency with the root of higher-order is smaller than that with the root of lower-order in intermediate wave number domains. However, the negative mode of the scaled wave frequency with the root of higher-order is found to be greater than that with the root of lower-order. It is found that the influence of order of the root of the Bessel function on the wave frequency of the space-charge dust-ion-acoustic wave in a cylindrically confined dusty plasma decreases with an increase of the propagation wave number. It is also found that the double frequency modes increase with increasing Mach number due to the ion flow in a cylindrical dusty plasma. In addition, it is found that the positive mode of the group velocity decreases with an increase of the scaled radius of the plasma cylinder. However, the negative mode group velocity increases with an increase of the radius of the plasma cylinder.

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Myoung-Jae Lee
Hanyang Univ

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