IMPORTANCE OF PLASMA ABSORPTION TO CHARACTERIZE THE TOTAL FORCE ACTING ON A DUST PARTICLE IN HIGHLY COLLISIONAL PLASMA SUBJECT TO A WEAK EXTERNAL ELECTRIC FIELD

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S u m m a r y

The linear dielectric response formalism has been used to calculate the total force acting on a small absorbing spherical grain immersed in a highly collisional, weakly ionized plasma subject to a weak external electric field. Taking both the ion and electron absorptions on a grain into account, it is shown that the total force, which is the resultant of the electric, ion and electron drag forces, is always directed along the direction of the electric force. The "effective" charge of a grain, which can be defined as the ratio of the total force to the strength of the electric field, is comparable to the magnitude of the actual grain's charge.