

## Correlation effects due to an axial propagation of projectiles in dusty plasma

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**Abstract:** The electrostatic potential for a single projectile is calculated moving with a constant velocity  $V_p$  along the z-axis using linear kinetic theory. To study the correlation effects, the work is extended to an array of projectiles, assumed to lie on sets of concentric circles propagating with the same velocity along the z-axis. Each circle carries  $N$  number of projectiles having radius  $r_1$  and angular position  $2\pi m/N$ . The generalized expressions for the Debye and the wake potential due to an axial propagation of dust grain projectiles are derived. A couple of specific cases of electrostatic potential due to four and eight projectiles are studied in some detail both analytically and numerically.