

Abstract Submitted
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A small body in a plasma: effects of ion flow and capture on the potential and fluid flow velocities¹ CHRISTOS STAVROU, Imperial Coll, UMBERTO DE ANGELIS, University of Naples and INFN Sezione di Napoli, Italy, JOHN ALLEN², OCIAM, Mathematical Institute, University of Oxford, Oxford OX2 6GG, UK, MICHAEL COPPINS, Imperial Coll — Although the potential, ion density and fluid velocity profiles of a flowing plasma around a small charged object can be obtained by means of PIC simulations, a theoretical approach allows an easier understanding of the role of the basic parameters: the ion flow speed, the dust radius and the ion to electron temperature ratio. These results allow for the calculation of ion drag, a problem of basic importance for fusion. We investigate how the potential, ion density and ion fluid velocities are modified when ion streaming and capture by the object are taken into account by using the simplest possible model of linear kinetic theory. The point-sink model is used, with the assumption that all the effects (presence of charged object, capture of ions, ion flow) introduce a “small” perturbation in the ion distribution function. Both supersonic and subsonic velocities are investigated. The calculations are compared with PIC simulations.

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