



Interaction of plasma flows with non-magnetized bodies: simulation from super-Alfvénic to sub-Alfvénic regime

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While several cases of plasma interaction are present in our solar system, extra-solar planets might offer a huge variety of new types of interactions. We study those possible interactions by means of the A.I.K.E.F. code, based on the hybrid model which consider electrons as a fluid and ions as particles. Our study starts with the case of the Earth's moon. We regard the surface of the Moon as a source of waves. We establish a general picture of the plasma interaction using magnetosonic waves triggered at the surface of the Moon and carried by the solar wind. We extend this study with a variation of the upstream velocity from a super-Alfvénic flow to a sub-Alfvénic regime, which should be realized for close-in extra-solar planets. A detailed study of the diamagnetic, polarization and induction currents in the vicinity of the body has been performed. We observe that the signature of a fast mode disappears and the currents switch from a horizontal distribution to a vertical distribution.