

Electric Fields and Plasma Perturbations in the Vicinity of the Moon

N. Borisov and U. Mall, Max-Planck -Institut fuer Aeronomie, Germany

The interaction of the solar wind with the Moon generates interesting physical effects in the vicinity of the Moon. Among those the formation of an elongated plasma depletion behind the Moon represents an important basic plasma theoretical problem. Theory predicts that two different physical mechanisms contribute to the refilling of this gap. We investigate the relative role of these two mechanisms and discuss several consequences (temperature changes of the charged particles penetrating into the wake, formation of ion beams and their acceleration, and the shape of the cavity at different distances from the Moon), all of which in principal can be checked by experiments on SMART 1. We predict the existence of a kinetic instability that gives rise to the low-frequency turbulence in the wake discovered by WIND. The level of the turbulence influences in turn the acceleration of ion beams.