The effects of charge exchange in the interaction between the solar wind and an unmagnetized planet

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The interaction between the solar wind and an unmagnetized planet (Venus or Mars) was investigated in the computer simulations by using a three-dimensional hybrid code (kinetic ions and massless fluid electrons). The purpose of this study is to examine effects of charge exchange on macro-scale structure around the planet. The results showed that the shock size and the magnetic barrier intensity were asymmetrical in the direction of the convection electric field because of oxygen ions escaping from the side of the planet to which the convection electric field was pointing when including charge exchange.

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