

On the deceleration of the solar wind caused by diffuse ions

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We study solar wind deceleration caused by diffuse ions in the upstream region of the Earth's bow shock. Previous observations showed that the solar wind deceleration becomes significant as the observer comes closer to the bow shock and is well correlated to the amplitude of the wave generated by diffuse ions. From the observation, it seems that efficient energy transfer and the momentum balance are realized among the solar wind, diffuse ions, and upstream waves. However, quantitative evaluation of this balance has not yet been done to the authors' knowledge. From the analysis of particle and field data obtained on Geotail we have successfully shown that the structure of the foreshock region is described in terms of the 'Cosmic-Ray Modified' shock theory.