

Cosmic ray spectra in the heliosheath

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After making two excursions with the solar wind termination shock in 2002 and 2003, Voyager 1 crossed this shock unambiguously on 16 December 2004. Since then cosmic ray intensity spectra have been observed in the heliosheath beyond this shock. The spectra of the anomalous cosmic ray component immediately behind the shock were not quite as expected from standard diffusive shock acceleration. In this paper we concentrate on the explanation of He spectra because this species has both a well-defined anomalous and galactic cosmic ray component. We interpret these spectra in terms of standard acceleration and modulation theory, and point out the difficulties with this. We then mention the possibility of stochastic Fermi acceleration in the heliosheath as an additional mechanism to explain the observations better.