



Solar wind structures and their effects on the plasma environment of Earth and Mars

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We performed a detailed study of the temporal evolution and spatial variation of the solar wind on different scales during the recent long solar activity minimum. We use STEREO Ahead and Behind, Venus Express and Mars Express in-situ plasma measurements to predict the solar wind properties and structures at any heliospheric in-ecliptic positions. We find that these predictions are valid at radial spacecraft separations as far as the Mars and Venus orbits and even at 60 degrees longitudinal separation due to the steadiness of the solar wind at this time. The recent solar activity minimum was dominated by alternating fast and slow solar wind streams creating long-lived corotating interaction regions. We show the effects of these solar wind structures on the plasma environment of the magnetized Earth and the unmagnetized planet Mars.