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3D simulations of the solar wind show that the location and shape of the Alfven surface (and other critical surfaces) can have significant variation with latitude/longitude, as well as with solar activity. In addition to these effects, turbulent fluctuations can introduce further variability, which occurs on a relatively finer scale. Here we use global magnetohydrodynamic simulations of the solar wind that are coupled to a non-WKB turbulence transport model, to examine the effects of local turbulence on the location and morphology of the Alfven zone. These analyses enable investigation of the "fractal" nature of this region, via computation of the filling fraction of sub/super-Alfvenic wind as a function of radius. We compare the simulation-based results with inferences obtained from Parker Solar Probe measurements, and discuss implications for remote imaging studies of the young solar wind.
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