

The source region of solar wind in the photosphere

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In this paper, we calculate coronal magnetic field expanding to the interplanetary space by the Radial-Field model (devised by Hakamada) with synoptic maps of photospheric magnetic data observed by the NSO/Kitt Peak, USA. We project solar wind speed distribution on the source surface observed by the STE-Lab of Nagoya University to the photosphere along the line of force in the coronal magnetic field. We found the following results; (1) around the maximum phase of solar activity cycle, slow speed solar winds emanate from very narrow string like areas surrounding closed magnetic regions in the photosphere which have extremely high magnetic expansion rate, (2) in the other phases, besides the maximum, high speed winds emanate from high latitudes of less magnetic expansion rate, except near the poles, and slow speed winds emanate from narrow belts of large magnetic expansion rate in low to middle latitudes extending the solar equator.

Keywords: solar wind, photosphere, source region, solar wind speed