

Long-term variations of the solar wind speed and the expansion rate of the coronal magnetic field

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Twelve synoptic maps of the solar wind speed (SWS) estimated by interplanetary scintillation observations are constructed during one solar activity cycle. Similar twelve synoptic maps of expansion rate (RBR) of the coronal magnetic field calculated by the so-called 'potential model' are also constructed during the same solar activity cycle. Twelve correlation diagrams between the SWS and the RBR are drawn with the data of these synoptic maps. We, then, estimate long-term variations of the correlation coefficient (r), the average SWS, and the average RBR and compare them with the relative sunspot number (RI). The SWS shows positive correlation with the RI in contrast to the negative correlation of the RBR with the RI. The SWS well correlates with the RBR during the quiet phase of the solar activity cycle. Our results suggest that the SWS can be estimated by the RBR during the quiet phase of the solar activity cycle.