

## Relationship between coronal hole area and solar wind speed

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We report the relationship between coronal hole areas and average solar wind speeds for Carrington rotations (CR) from 1893 to 2108. The coronal hole is known as a region with low X-ray emissivity, and a source of the high speed solar wind. Nolte et al. (1976) investigated the relationship between equatorial coronal holes, which are located within  $\pm 10$  degrees of the ecliptic plane, and the maximum solar wind speed using Skylab data. As the result, they reported a linear correlation between the coronal hole area and the maximum wind speed with a slope of  $80 \pm 2 \text{ km s}^{-1} (10^{10} \text{ km}^2)^{-1}$ . In this study, we identify coronal holes using synoptic magnetic field data of Kitt-Peak National Solar Observatory (KP/NSO) and the potential field source surface (PFSS) model. The speeds of the solar wind from coronal holes are determined from interplanetary scintillation (IPS) observations of STEL which provide global information of the solar wind. Our analysis reveals a linear relationship between the coronal holes area and the average solar wind speed similarly to Nolte et al. (1976), but with a more gentle slope than the earlier study. We also discuss its dependence on the solar activity.

Keywords: solar wind, coronal hole