

# **A NEW FORECASTING INDEX FOR SOLAR WIND VELOCITY BASED ON EIT 284 Å OBSERVATIONS**

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Various solar wind forecasting methods have been developed during the past decade, such as the Wang-Sheeley model and the Hakamada-Akasofu-Fry Version 2 (HAFv2) model. Also, considerable correlation has been found between the solar wind speed  $v$  and the coronal hole (CH) area  $A_M$  on the visible side of the sun, showing quantitative improvement of forecasting accuracy in low CME activity periods. Properties of lower layers of the solar atmosphere are good indications of the subsequent interplanetary and geomagnetic activities. We analyze the SOHO/EIT 284 Å images and construct a new forecasting index (Pch) from the brightness of the solar EUV emissions, and a good correlation is found between the Pch index and the 3-day-lag solar wind velocity  $v$  probed by the ACE spacecraft. A simple method of forecasting the solar wind speed near Earth in low CME activity periods is presented. Between Pch and  $v$  from 21 November until 26 December 2003, the linear correlation coefficient is  $R = 0.89$ . In another period (DOY 25 – 125, 2005) the correlation coefficient between Pch and  $v$  is  $R = 0.70$ . The average relative difference between the calculated and the observed values is  $|\delta| \approx 12.15\%$ . Furthermore, for the ten peaks during the analysis period, Pch and  $v$  show a correlation coefficient of  $R = 0.78$ , and the average relative difference between the calculated and the observed peak values is  $|\delta| \approx 5.83\%$ . Moreover, the Pch index does not depend on the CH-boundary estimate and can reflect both the brightness and area of CH. Until now the CH-boundary could not be easily determined since no quantitative criteria can be used to precisely locate CHs from observations. At last, we show the Lomb-Scargle Periodogram of Pch and solar wind velocity  $v$ , density  $n$  and proton temperature  $T$ .

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