JOURNAL OF GEOPHYSICAL RESEARCH,

An improved expected temperature for interplanetary coronal mass ejections

H. A. Elliott,[1] D. J. McComas,[1] N. A. Schwadron,[1]
G. Gloeckler,[3] and T. H. Zurbuchen[4]

Received 17 September 2004; revised 25 November 2004; accepted 11

[1] In this study we compare nearly 5 years of solar measurements from the Solar Wind Electron Proton Advanced Composition Explorer (ACE) to derive ar formula to identify interplanetary coronal mass eject proton temperatures have long been associated with not present, the solar wind speed and temperature ar studies have derived fits to these measurements. Usin is determined from the solar wind speed. Anomalou identified as times when the ratio of the measured to e this study we remove ICMEs before fitting the rema the solar wind interact and cause compressions and away from the Sun. Since such interaction causes th parcels to change, we separately fit compression and expected temperature formula derived in this way pr ICMEs than previous formulas, particularly in comp

Citation: Elliott, H. A., D. J. McComas, N. A. Schwadron, J. T improved expected temperature formula for identifying interpla doi:10.1029/2004JA010794.

1. Introduction

[2] Early in situ solar wind measurements showed th solar wind proton temperature and speed are generally we correlated [*Neugebauer and Snyder*, 1966]. Many studie since then have fit proton temperature (Tp) as a function o speed (V). The "expected temperature" (T_{ex}) is an estimat of the temperature determined from solar wind spee measurements using a formula based on a fit. One of th earliest fits was done by *Hundhausen et al.* [1970], wh concluded that Vela 3 data could be fit well with either linear fit to $\sqrt{Tp}$ or Tp versus V. *Burlaga and Ogilvie* [1970 fit $\sqrt{Tp}$ versus V in their analysis of Explorer 34 data. *Lope and Freeman* [1986] found that the slope of the Tp-V curv