

Project Details

ROSES ID: NRA-03-OSS-01

Selection Year: 2004

Program Element: Independent Investigation: LWS

Project Title:

Short-Term Time Evolution of Coronal Holes and Their Impact on the Solar Wind at 1AU

PI Name: Giuliana de Toma

PI Email: atn@g.ucla.edu

Affiliation: National Center for Atmospheric Research

Summary:

Coronal holes are the source of high-speed solar wind streams, and possibly of slow-speed streams, and thus play an important role in the nature and structure of the solar wind/heliosphere. Over the last decade, significant progress has been made in our ability to predict ambient solar wind conditions days in advance using a number of different models that vary widely in their sophistication (e.g., MHD and Potential Field Source Surface Models) but all of which are driven by photospheric magnetic field synoptic maps. These ambient solar models are not expected to and generally do not work well during periods of transient wind. However, a very recent comprehensive study by Arge et al. has shown that significant discrepancies often occur between model predictions and observations after transient wind has completed its passage past Earth and the observed solar wind has returned to ambient/background conditions (i.e., when the model is expected to resume performing well). Such discrepancies can persist for 2 to 3 days after the passage of the transient. To understand the origin of these differences, we will use coronal observations at time of CMEs to study variations in the pattern of coronal holes at the Sun. Our goal is to investigate if short-term changes in coronal holes (probably not visible in photospheric field synoptic maps) can be responsible for the changes seen at 1AU.

Publication References:

Summary: "

Reference: Giuliana de Toma / National Center for Atmospheric Research-Short-Term Time Evolution of Coronal Holes and Their Impact on the Solar Wind at 1AU