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49.01 Are Interplanetary Magnetic Clouds Manifestations of Coronal Mass Ejections at 1 AU?

E. Hildner and R. M. Wilson (NASA/MSFC)

Using proxy data for the occurrence of those mass ejections from the solar corona which are directed earthward, we have investigated the association between post-1970 interplanetary magnetic clouds (ICMs) and coronal mass ejections (CMEs). The evidence linking magnetic clouds following shocks with CMEs is striking: six of nine clouds observed at Earth were preceded by an appropriate period of time earlier by meter-wave type II radio bursts indicative of coronal shock waves and CMEs occurring near central meridian. During the selected control periods, no clouds were detected near Earth, the only type II bursts reported were associated with solar activity near the 11-yr. Where the proxy solar data to be sought are not so clearly suggested -- for clouds preceding interaction regions and clouds within cold magnetic enhancements - the evidence linking the clouds and CMEs is not as clear; proxy data usually suggest many candidate mass-ejection events for each cloud. Overall, the data are consistent with and support the hypothesis suggested by Klein and Burlaga that magnetic clouds observed with spacecraft at 1 AU are manifestations of solar coronal mass ejection events.

49.02 Quasi-steady Mass Flow in Coronal Loops

A.N. McClymont (UCSD) and I.J.D. Craig (U. Waikato).

The effect of steady state upflow or downflow on the energy balance and differential emission measure of coronal loops is discussed, including heating, conduction, mass motion, and optically thin radiation in the energy equation. The scaling law for quasi-static loops, which links loop temperature, density, and length, is extended to the flow in evaporating and draining loops: $T = \frac{3.8 \times 10^{4}}{\sqrt{\frac{\beta}{\alpha} \frac{A}{L}}} \left[ 1 - \frac{1}{2} \frac{\alpha}{\beta} \frac{k}{\sqrt{T}} \frac{A}{L} \right]^1/2$.

49.04 Magnetic Structure and Heating of the Upper and Lower Transition Region

J. F. Dowdy, Jr., S. T. Wu (UAH), R. L. Moore (NASA/MSFC)

We present a two-component model for the transition region of the quiet sun. It consists of (1) a "lower T.R." ($T_1 \lesssim 10^5$) contained in closed magnetic loop structures, which are confined to the quiet sun network, and (2) an "upper T.R." ($10^5 \lesssim T_2 \lesssim 10^6$) contained in open field structures which reach coronal heights and temperatures, but which are now rooted in only a fraction of the network area due to the constricting influence of the lower T.R. magnetic field. This picture is implied by the observed fine-scale structure of the transition region and magnetic field in quiet regions.

We are two major consequences to this picture. (1) The lower T.R. is effectively insulated from the corona and upper T.R. (2) The upper T.R. can be heated by the corona as in previous models, but the increased conduction of the magnetic field significantly reduces the role of "back conduction," as an energy sink for the corona. High resolution magnetograms indicate a conduction factor of 1 as opposed to 10 for previous models. It is suggested that the back conduction loss from the corona is only about 1 X 10$^4$ erg cm$^2$ s$^{-1}$ as opposed to several times this amount in previous models.

49.05 Preliminary Observations on the Energy Budget of a Solar Activity Complex, July-Sept. 1982

G.A. Chapman, A.D. Herzog, J.K. Lawrence, Kim Ekenas, Carolyn Mallory (SPD/CSUN), and J.C. Shelton (TW)

We are continuing a program to measure the irradiance fluctuations of active solar regions in several clean continuum windows. The data are obtained with the Meticon S-series diode arrays and the SPD 61/28 cm vacuum telescopes and spectroheliograph. Irradiance data have already been presented for one disk passage of the activity complex (BBSt 8651L, August 1982). Those irradiance fluctuations, when converted to luminosity fluctuations, showed that over a two-week interval faculae radiated nearly 60% of the sunspot luminosity deficit. We will present the preliminary results for this same complex from July 1982 when it was BBSt 8600 18474 and from September when it was NOAA/USAF nos. 3885/3886. This work has been supported by the NSF under grants AST-8121683 and AST-8300454.

49.06 Magnesium Abundances in Field Dwarf Stars

J.B. Laird (U. Michigan)

Intermediate-dispersion (43 A/mm) image-tube spectra have been obtained for a large number of F- and G-type field dwarf stars. The program sample includes both halo and disk stars, covering a wide range of metal abundance. The spectra include the Mg I b lines (5167-5183 A), which are used to derive magnesium abundance. Discussions of these spectra. Results for Mg/Fe abundances will be presented and discussed in connection with Galactic chemical evolution.