ON THE ORIGIN OF SOLAR HALO CORONAL MASS EJECTIONS[1]

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We present an investigation of halo coronal mass ejections (HCMEs) to understand the origin of HCMEs which is very important because HCMEs are regarded as main causes of heliospheric and geomagnetic disturbances. In this study, we have investigated 313 HCMEs observed during 1996–2012 by LASCO, coronal holes (CHs) and solar flares phenomena. On investigation of 313 HCMEs and related solar flares and coronal holes data, we find that all 313 HCMEs were observed when there were CHs and solar flares within 10° to 60°. We also find that the 128 (40.8%) and 88 (23.6%) HCMEs events were observed when there were CHs and solar flares within 10° and 20°, respectively. The speed of HCMEs does not increase with the increase of the area of CHs while the solar winds speed increases with increase of CHs area. We are of the view that the HCMEs may have been produced by some mechanism, in which the mass ejected by solar flares or active prominences, gets connected with the open magnetic lines of CHs (source of high speed solar wind streams) and moves along them to appear as a HCMEs, earlier suggested by Verma and Pande (1989) and Verma (1998, 2002). The various results obtained in the present analysis are discussed in the light of existing scenario of heliospheric physics.

Key words: *Sun, coronal mass ejections, solar flares, coronal holes, solar wind.*

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