

Classification of Solar Coronal Mass Ejections Based on LASCO Observations

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In this paper we present a new classification of solar coronal mass ejections (CME) based on initial speed of CMEs events observed by LASCO/ SOHO. As we know that for mass ejections from Sun's surface the required escape velocity is about 618 km/sec and as the height increases in the solar atmosphere the escape velocity of mass ejection decreases with height of solar atmosphere. Keeping this fact in mind, we have studied and classified the CMEs observed in years 2000, 2001, 2002 and 2003. In classifying CMEs we assume that if the initial observed speed of CMEs material is less than the escape velocity at that solar atmospheric height then we call such CMEs as non-escape speed-CMEs(NES-CMEs) and if the initial speed of CMEs material is more than the escape velocity at that solar atmospheric height then we call such CMEs as escape speed-CMEs(ES-CMEs). Further, if the initial speed of CMEs material is more 1000 km/sec at that solar atmospheric height then we call such CMEs as high speed-CMEs(HS-CMEs). From the study of LASCO CMEs observed in years 2000, 2001, 2002 and 2003 we found that about 42% CMEs were NES-CMEs, 48% CMEs were ES-CMEs and ~ 10% CMEs were HS-CMEs. We further studied the few properties of NES-CMEs, ES-CMEs and HV-CMEs that includes latitudinal distribution, speed distribution, acceleration distribution and duration distribution etc. of all classes of CMEs.

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