

# Coronal Mass Ejections in the Solar Wind

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Coronal mass ejections (CMEs) are large-scale magnetized plasma structures adding large amounts of mass (up to  $\sim 10^{16}$  g) and magnetic field to the ordinary solar wind. Earth is immersed in the CME-related solar wind for about 30% of the time during solar maxima and up to 10% of the time during solar minima. CMEs have two primary consequences in geospace: plasma impact and particle impact. The plasma impact results in geomagnetic storms. The particle impact is a direct consequence of CME-driven shocks because these shocks accelerate solar energetic particles (SEPs) to energies as high as 10 GeV. After summarizing the properties of CMEs as observed by recent coronagraphs, I will describe their properties as observed in the solar wind by in situ observations. I will also describe the solar sources of the geoeffective and SEP-effective CMEs and compare them. Finally, I will discuss the solar cycle variation of the solar sources. Work supported by NASA/LWS and SR&T programs.