SOLAR ORIGINS OF CORONAL MASS EJECTIONS

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The large scale properties of coronal mass ejections (CMEs), such as morphology, leading edge speed, and angular width and position, have been cataloged for many events observed with coronagraphs on the Skylab, P-78, and SMM spacecraft. While considerable study has been devoted to the characteristics of the CMEs themselves, their solar origins are still only poorly understood. Recent observational work has involved statistical associations of CMEs with flares and filament eruptions, and some evidence exists that the flare and eruptive-filament associated CMEs define two classes of events, with the flare-associated events being generally more energetic. Nevertheless, we have found that eruptive-filament CMEs can at times be very energetic, giving rise to interplanetary shocks and energetic particle events. The size of the impulsive phase in a flare-associated CME seems to play no significant role in the size or speed of the CME, but the angular sizes of CMEs may correlate with the scale sizes of the 1-8 Å X-ray flares. At the present time, He 10830 Å observations should be useful in studying the late development of double-ribbon flares and transient coronal holes to yield insights into the CME aftermath. The recently available white-light synoptic maps may also prove fruitful in defining the coronal conditions giving rise to CMEs.