The Structure of Solar Coronal Mass Ejections in the Extreme-Ultraviolet Passbands

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So far, most studies on the structure of coronal mass ejections (CMEs) are conducted through white-light coronagraphs, which demonstrate about one third of CMEs exhibit the typical three-part structure in the high corona (e.g., beyond 2 Rs), i.e., the bright front, the dark cavity and the bright core. In this presentation, we address the CME structure in the low corona (e.g., below 1.3 Rs) through extreme-ultraviolet (EUV) passbands and find that the three-part CMEs in the white-light images can possess a similar three-part appearance in the EUV images, i.e., a leading edge, a low-density zone, and a filament or hot channel. The analyses identify that the leading edge and the filament or hot channel in the EUV passbands evolve into the front and the core later within several solar radii in the white-light passbands, respectively. What's more, we find that the CMEs without obvious cavity in the white-light images can also exhibit the clear three-part appearance in the EUV images, which means that the low-density zone in the EUV images (observed as the cavity in white-light images) can be compressed and/or transformed gradually by the expansion of the bright core and/or the reconnection of magnetic field surrounding the core during the CME propagation outward. Our study suggests that more CMEs can possess the clear three-part structure in their early eruption stage. The nature of the low-density zone between the leading edge and the filament or hot channel is discussed.