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An Empirical Approach to Reconstructing CME Morphology from Coronagraphic and Heliospheric STEREO Images

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A principal goal of the STEREO mission is the reconstruction of CME morphologies by using two spacecraft to observe events from two very different locations. STEREO's heliospheric imaging capabilities are also very helpful in assessing CME structure, as well as allowing the study of structural evolution in the interplanetary medium (IPM). We will present examples of several CMEs that are well observed by STEREO both close to the Sun and in the IPM. The appearance of some can be reproduced with simple 3-D lobular fronts. Some show clear evidence of flux rope morphologies, which have for some time been the favored structural model for most CMEs. For some events the assumption of simple self-similar expansion seems to work reasonably well. Other events clearly show significant evolution of the CME morphology. We have developed procedures for empirically reconstructing the morphology of all of these types of CMEs, and we will show examples of 3-D CME reconstructions computed within this framework.