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The relationship between CME speed and soft X-ray emission and the prediction of the arrival times of ICMEs near Earth

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While STEREO observations provided a major step forward in our understanding of the interplanetary propagation of coronal mass ejections (CME), the basic observational input to the forecasting of CME arrival at Earth has for a long time been the CME speed estimated from coronagraphic measurements on the Sun-Earth line. In this contribution the performance of these measurements is compared with a proxy approach: the speed of Earth-directed CMEs in the corona is inferred from the fluence of the associated soft X-ray bursts, using an empirical relationship that we established considering CMEs originating near the solar limb in solar cycle 23. We use both the CME speed measured in the plane of the sky by SoHO/LASCO and the speed estimated from the soft X-rays as an input to the simple empirical interplanetary propagation model devised by Gopalswamy and coworkers, and compared the predicted arrival times of the interplanetary CMEs (ICMEs) near 1 AU with in situ measurements in the case of 26 well-observed events. We show that for a range of CME speeds between about 700 and 1700 km/s the soft X-ray proxy gives a better prediction of the ICME arrival than the use of the plane-of-the-sky speed measured by the coronagraph on the Sun-Earth line.