
Statistical relationship between CME speed and soft X-ray intensity of the associated flare during solar cycle 23

Karl Ludwig Klein^{*†1} and Carolina Salas-Matamoros^{*2}

¹Laboratoire d'études spatiales et d'instrumentation en astrophysique (LESIA) – Université Paris VI - Pierre et Marie Curie, Observatoire de Paris, INSU, CNRS : UMR8109, Université Paris VII - Paris Diderot – 5, place Jules Janssen 92190 MEUDON, France

²Space Research Center, University of Costa Rica (CINESPA) – 2060, San Pedro, Montes de Oca, San José, Costa Rica

Abstract

We present the statistical study of CME velocities reported by the SOHO/LASCO catalogue and Soft X-Ray measurements from the GOES satellite during the period between 1996 and 2008, to explore the possible correlation between CME speed and parameters of the associated X-ray flare, as the peak flux. One of the principal disadvantages in this sort of studies is that since we can only measure the projected CME speed, an existing correlation may be smeared out if one considers CMEs irrespective of their location on the Sun. In our work we focused on very specific CMEs, which originate near the solar limb (so that projection effects are minimized), have position angles $PA=60^\circ-120^\circ$ and $PA=240^\circ-300^\circ$ and linear velocity ≥ 300 km/s. The flare association is inferred from the timing association and the linear speed of the CME. We have found a positive correlation about 0.5 for 66 events with solar origin between longitudes 70 and 85 degrees. In this work we will study the correlation of these data in more detail, because the fact of finding a high-quality correlation is relevant to Space Weather, since the continuously measured Soft X-Ray flux of the Sun could be useful to find an approximation of the CME speed and possibly, the transit time of the CME from the Sun to the Earth.

Keywords: CME, flares

*Speaker

†Corresponding author: ludwig.klein@obspm.fr