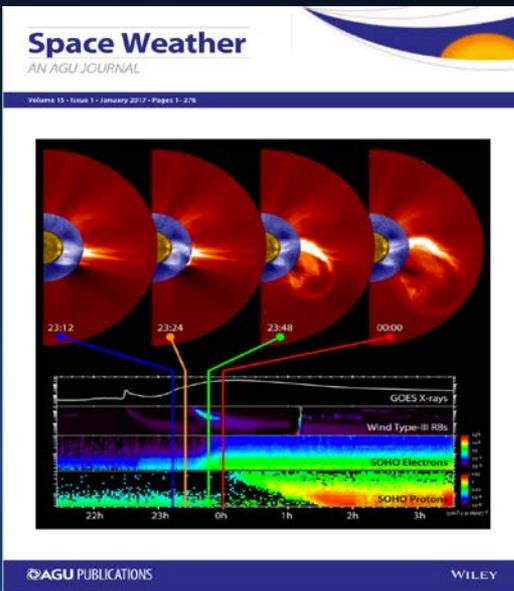
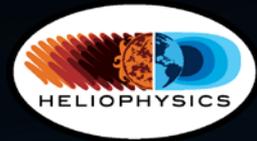




Scientists demonstrate a new Solar Energetic Particle warning technique using K-COR ground coronagraph data



A Heliophysics science publication using ESA/NASA SOHO observations and data from the National Center for Atmospheric Research's K-COR ground-based coronagraph is highlighted on the front page of the January 2017 issue of *Space Weather*, an American Geophysical Union Publication.

The paper's authors analyzed data on a fast coronal mass ejection (CME) event in early 2016 from the K-COR ground-based coronagraph and SOHO particle and coronagraph observations. Fast CMEs have a high association rate with solar energetic particle events (SEPs), which can produce hazardous conditions for human and robotic space exploration, as well as airline passengers on polar routes. According to recent recommendations from the National Research Council, the forecasting and warning of SEP events "should be an essential part of a comprehensive radiation mitigation strategy".

The scientists found that using the ground-based coronagraph observations to warn of the 2 January 2016 SEP event provides a significant temporal advantage when compared with other existing techniques used to forecast SEP events. Because K-COR was able to detect the eruption of the CME lower in the solar atmosphere than SOHO, they show that ground-based coronagraph data could allow an SEP onset warning based on observations of a solar eruption before the energetic particles leave the solar environment.

The paper shows that for this CME, K-COR would have produced an earlier onset warning as compared to other SEP event occurrence forecast methods including the NOAA's Space Weather Prediction Center (SWPC) *Protons* that is driven by solar flare parameters and the latitude of the flare location on the sun; and RELeASE, that is driven by measurements of first-arriving solar relativistic electrons measured from near Earth. RELeASE uses observations provided by the SOHO CoSTEP instrument, which is led by the University of Kiel (Germany).

The paper notes that a prototype SEP-onset warning capability can be realized with only modest modifications to the K-Cor observations to include software-based CME detection, measurement and warning schemes.