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Coronal dimmings as indicators of the CME evolution close to the Sun

Galina Chikunova¹, Tatiana Podladchikova¹, Karin Dissauer^{2,3}, and Astrid Veronig^{3,4}

¹Skolkovo Institute of Science and Technology, Moscow, Russian Federation (galina.chikunova@skoltech.ru)

²NorthWest Research Associates, Boulder, USA

³Institute of Physics, University of Graz, Graz, Austria

⁴Kanzelhohe Observatory for Solar and Environmental Research, University of Graz, Treffen, Austria

Coronal dimmings are regions in the solar corona that represent a sudden decrease of the coronal EUV and SXR emission, which is interpreted as a density depletion caused by the evacuation of plasma due to the CME eruption. Distinct relations have been established between coronal dimming parameters (intensity, area, magnetic flux) and key characteristics (mass, speed) of the associated CMEs by combining coronal and coronagraphic observations from different viewpoints in the heliosphere (Dissauer et al. 2019, Chikunova et al. 2020).

In this contribution, we study whether coronal dimmings can be used to indicate possible deflections of CMEs close to the Sun and to identify their propagation direction. We present a set of detailed case studies where, by using simultaneous observations from the SDO and STEREO satellites, we track both the evolution of the coronal dimmings and the CME properties with respect to their directions. Our findings suggest that the direction of growth of the coronal dimming region and the evolution of the dimming intensity are related to the initial direction of the CME and also reflect various changes in its evolution, indicating deflection and/or interaction with surrounding active regions. These findings are important in better constraining CME evolution and direction close to the Sun and its further connection toward interplanetary space.