



In-Situ Multi-Spacecraft and Remote Imaging Observations of the First CME Detected by Solar Orbiter and BepiColombo

Emma Davies^{1,8}, Christian Möstl^{2,3}, Matthew Owens⁴, Andreas Weiss^{2,3,5}, Tanja Amerstorfer², Jürgen Hinterreiter^{2,5}, Maïke Bauer², Rachel Bailey⁶, Martin Reiss^{2,3}, Robert Forsyth¹, Timothy Horbury¹, Helen O'Brien¹, Vincent Evans¹, Virginia Angelini¹, Daniel Heyner⁷, Ingo Richter⁷, Hans-Ulrich Auster⁷, Werner Magnes², Wolfgang Baumjohann², David Fischer², and the RAL Space STEREO HI Team*

¹Imperial College London, Space and Atmospheric Group, Physics, United Kingdom of Great Britain

²Space Research Institute, Austrian Academy of Sciences, Graz, Austria

³Institute of Geodesy, Graz University of Technology, Graz, Austria

⁴Space and Atmospheric Electricity Group, Department of Meteorology, University of Reading, Reading, UK

⁵Institute of Physics, University of Graz, Graz, Austria

⁶Conrad Observatory, Zentralanstalt für Meteorologie und Geodynamik, Vienna, Austria

⁷Technical University of Braunschweig, Braunschweig, Germany

⁸University of New Hampshire, NH, USA

*A full list of authors appears at the end of the abstract

On April 19th 2020 a CME was detected by Solar Orbiter at a heliocentric distance of 0.8 AU and was also observed in-situ on April 20th by both Wind and BepiColombo. During this time, BepiColombo had just completed a flyby of the Earth and therefore the longitudinal separation between BepiColombo and Wind was just 1.4°. The total longitudinal separation of Solar Orbiter and both spacecraft near the Earth was less than 5°, providing an excellent opportunity for a radial alignment study of the CME. We use the in-situ observations of the magnetic field at Solar Orbiter with those at Wind and BepiColombo to analyse the large-scale properties of the CME and compare results to those predicted using remote observations at STEREO-A, providing a global picture of the CME as it propagated from the Sun to 1 AU.

RAL Space STEREO HI Team: David Barnes, Jackie Davies, Richard Harrison