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SO/PHI on Solar Orbiter, the first magnetograph to leave the Sun-Earth line: The instrument, its first data and its scientific promise

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The Solar Orbiter mission of ESA and NASA is currently on a trajectory that will take it into the inner heliosphere from where it will explore the Sun (and heliosphere) from close up and from out of the ecliptic plane. It aims to address the overarching questions of how the Sun creates and controls the heliosphere, and why solar activity changes with time. Among the instruments that Solar Orbiter carries is the Polarimetric and Helioseismic Imager (SO/PHI), which is the first magnetograph to observe the Sun from outside the Sun-Earth line. Already the trajectory provides SO/PHI with unique capabilities, although it also poses huge challenges, which could only be overcome by technology developments on a significant scale. Although Solar Orbiter is still in cruise phase first glimpses of SO/PHI's capabilities have become apparent, including the excellent quality of the data. The promise for the science that can be done with SO/PHI data in the future is immense, both with standalone observations by SO/PHI and with SO/PHI data combined with observations made by other Solar Orbiter instruments, or with data gathered by instruments on other spacecraft or on the ground. The talk will give a brief description of the Solar Orbiter mission, introduce the SO/PHI instrument, show first data and describe the science goals for the different phases of the Solar Orbiter mission. The SO/PHI data policy will also be briefly introduced.

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