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The Heliophysics Event Catalogue (HEC): an advanced tool of the Heliophysics Integrated Observatory (HELIO) for space weather event characterisation

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The Heliophysics Event Catalogue (HEC) is a software tool that has been developed as a special service in the framework of the EC FP7 project "Heliophysics Integrated Observatory (HELIO)". HEC is a component of the HELIO metadata server infrastructure, and it is based on a relational data base management system which indexes a set of catalogues relevant to events observed in the heliosphere by ground- and space-based instruments. To date, thirty-nine event catalogues have been ingested and are searchable through HEC both at machine level via a web service system and at high level via a Graphical User Interface (GUI) accessible via web. Such catalogues include: a) summary data (e.g., NOAA SRS active regions, NOAA daily solar data); b) primary solar event lists (e.g., GEV GOES x-ray flares, h-alpha flares, SOHO/LASCO CMEs); c) solar event lists from individual observatories (e.g., HESSI flare list, STEREO/HI solar wind transients); d) geoeffective events (e.g., NOAA proton events, BAS magnetic storms, Ground Level Enhancements). Therefore, HEC can be used to characterise space weather events that originate at the Sun, propagate through the heliosphere and manifest at the planets by interacting with the planetary environments. In fact, the main aim of HEC is to provide a first description of heliospheric events observed from the Sun to the planets in order to allow the HELIO infrastructure to provide the user with a refined search focused on the specific scientific goal. In this work, we describe the architecture and the GUI of HEC, and we illustrate a sample science use case that points out its capabilities.