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HELCATS - Heliospheric Cataloguing, Analysis and Techniques Service

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Understanding the evolution of the solar wind is fundamental to advancing our knowledge of energy and mass transport in the solar system, rendering it crucial to space weather and its prediction. The advent of truly wide-angle heliospheric imaging has revolutionised the study of both transient (CMEs) and background (SIRs/CIRs) solar wind plasma structures, by enabling their direct and continuous observation out to 1 AU and beyond. The EU-funded FP7 HELCATS project combines European expertise in heliospheric imaging, built up in particular through lead involvement in NASA's STEREO mission, with expertise in solar and coronal imaging as well as in-situ and radio measurements of solar wind phenomena, in a programme of work that will enable a much wider exploitation and understanding of heliospheric imaging observations.

With HELCATS, we are (1.) cataloguing transient and background solar wind structures imaged in the heliosphere by STEREO/HI, since launch in late October 2006 to date, including estimates of their kinematic properties based on a variety of established techniques and more speculative, approaches; (2.) evaluating these kinematic properties, and thereby the validity of these techniques, through comparison with solar source observations and in-situ measurements made at multiple points throughout the heliosphere; (3.) appraising the potential for initialising advanced numerical models based on these kinematic properties; (4.) assessing the complementarity of radio observations (in particular of Type II radio bursts and interplanetary scintillation) in combination with heliospheric imagery.

We will, in this presentation, provide an overview of progress from the first 18 months of the HELCATS project.