



The Operational Performance of the COMESEP SEPForecast Tool

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The COMESEP SEPForecast tool provides alerts for the risk of solar energetic particle (SEP) radiation storms following the observation of solar flares. The combination of the likelihood of occurrence and expected peak flux determines the risk level. The predictions of these quantities are based on the intensity and location of the flare, angular width and speed of an associated coronal mass ejection (CME), and whether a ground level enhancement (GLE) is observed or not. This information is received through the COMESEP Alert System, which also disseminates the alerts to the end-user. The COMESEP Alert System and tools have been developed under the FP7 COMESEP (COronal Mass Ejections and Solar Energetic Particles: forecasting the space weather impact) project and has been operational since November 2013. The system has been integrated into the ESA Space Situational Awareness (SSA) Space Weather Element (SWE) network in September 2016.

The performance of the SEPForecast tool during the operational period is evaluated by comparing the issued forecasts with the observed conditions to derive various verification metrics. A selected set of time periods, missed events and false alarms are examined in more detail in order to identify shortcomings of and potential improvements to the system. The technical performance and specific issues encountered while running the operational system, which was developed as a prototype for an automated system from observation to alert dissemination, are also discussed.