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The COMESEP SEP forecast tool

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The FP7 COMESEP (COronal Mass Ejections and Solar Energetic Particles: forecasting the space weather impact) project developed tools for forecasting geomagnetic storms and solar energetic particle (SEP) radiation storms. Here we present the SEP forecast tool which provides a prediction of the probability for an SEP event to occur near Earth following the real-time observation of an X-ray flare, and estimates the most likely impact if such an event would occur. The tool has been operational on the COMESEP alert system (http://www.comesep.eu/alert) since November 2013. Alerts are provided for proton storms with E>10 MeV and E>60 MeV in the form of a risk level, combining the probability and expected impact. The predictions are based on a statistical analysis of SEP events and their parent solar activity during Solar Cycle 23. The input parameters are the flare intensity and longitude location, as well as the CME speed and width, if an observed CME can be associated with the flare. This information is also received through the COMESEP system. Alerts are based on the available information when triggered and are subsequently updated if more information becomes available. The forecast for the probability, the impact and risk level are evaluated on events from solar cycles 22 and 24. The effect of including flare location and CME parameters is also studied. The performance of the SEP forecast tool within the COMESEP alert system will be described.

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