



Validation of the CME Geomagnetic forecast alerts under COMESEP alert system

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An automated space weather alert system has been developed under the EU FP7 project COMESEP (COronal Mass Ejections and Solar Energetic Particles: <http://comesep.aeronomy.be>) to forecast solar energetic particles (SEP) and coronal mass ejection (CME) risk levels at Earth. COMESEP alert system uses automated detection tool CACTus to detect potentially threatening CMEs, drag-based model (DBM) to predict their arrival and CME geo-effectiveness tool (CGFT) to predict their geomagnetic impact. Whenever CACTus detects a halo or partial halo CME and issues an alert, DBM calculates its arrival time at Earth and CGFT calculates its geomagnetic risk level. Geomagnetic risk level is calculated based on an estimation of the CME arrival probability and its likely geo-effectiveness, as well as an estimate of the geomagnetic-storm duration. We present the evaluation of the CME risk level forecast with COMESEP alert system based on a study of geo-effective CMEs observed during 2014. The validation of the forecast tool is done by comparing the forecasts with observations. In addition, we test the success rate of the automatic forecasts (without human intervention) against the forecasts with human intervention using advanced versions of DBM and CGFT (self standing tools available at Hvar Observatory website: <http://oh.geof.unizg.hr>). The results implicate that the success rate of the forecast is higher with human intervention and using more advanced tools. This work has received funding from the European Commission FP7 Project COMESEP (263252). We acknowledge the support of Croatian Science Foundation under the project 6212 „Solar and Stellar Variability“.