



Space Environment Forecasting with Neutron Monitors: Establishing a novel service for the ESA SSA Program

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High-energy particles released at the Sun during a solar flare or a very energetic coronal mass ejection, result to a significant intensity increase at neutron monitor measurements known as Ground Level Enhancements (GLEs). Due to their space weather impact (i.e. risks and failures at communication and navigation systems, spacecraft electronics and operations, space power systems, manned space missions, and commercial aircraft operations) it is crucial to establish a real-time operational system that would be in place to issue reliable and timely GLE Alerts. Currently, the Cosmic Ray group of the National and Kapodistrian University of Athens is working towards the establishment of a Neutron Monitor Service that will be made available via the Space Weather Portal operated by the European Space Agency (ESA), under the Space Situational Awareness (SSA) Program. To this end, a web interface providing data from multiple Neutron Monitor stations as well as an upgraded GLE Alert will be provided. Both services are now under testing and validation and they will probably enter to an operational phase next year. The core of this Neutron Monitor Service is the GLE Alert software, and therefore, the main goal of this research effort is to upgrade the existing GLE Alert software, to minimize the probability of a false alarm and to enhance the usability of the corresponding results. The ESA Neutron Monitor Service is building upon the infrastructure made available with the implementation of the High-Resolution Neutron Monitor Database (NMDB). In this work the structure of the Neutron Monitor Service for ESA SSA Program and the impact of the novel GLE Alert Service that will be made available to future users via ESA SSA web portal will be presented and further discussed.