Contribution ID: **69** Type: **not specified**

The Neutron Monitor Database (NMDB)

Monday 19 October 2015 15:30 (45 minutes)

Since the International Geophysical Year (IGY) in 1957-58 cosmic rays are routinely measured by many ground-based Neutron Monitors (NM) around the world. The World Data Center for Cosmic Rays (WDCCR) was established as a part of this activity and is providing a database of cosmic-ray neutron observations in unified formats. However, that standard data comprises only of one hour averages, whereas most NM stations have been enhanced at the end of the 20th century to provide data in one minute resolution or even better. This data was only available on the web-sites of the institutes operating the station, and every station invented their own data format for the high-resolution measurements. There were some efforts to collect data from several stations, to make this data available on FTP servers, however none of these efforts could provide real-time data for all stations. In 2008 and 2009 an EU FP7 project (NMDB: real-time database for high-resolution Neutron Monitor measurements, http://nmdb.eu) was funded by the European Commission, and a new database was set up by several Neutron Monitor stations in Europe and Asia to store high-resolution data and to provide access to the data in real-time (i.e. less than five minute delay). By storing the measurements in a database, a standard format for the high-resolution measurements is enforced. This database is complementary to the WDCCR, as it does not (yet) provide all historical data, but the creation of this effort has spurred a new collaboration between Neutron Monitor scientists worldwide, (new) stations have gone online (again), new projects are building on the results of NMDB (SEPSever, HESPERIA), new users outside of the Cosmic Ray community are starting to use NM data for new applications like soil moisture measurements using Cosmic Rays. These applications are facilitated by the easy access to the data with the http://nest.nmdb.eu interface that offers access to all NMDB data for all users.

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Session Classification: Poster Session