

Extensive survey of NM databases with source recommendation list

Monday, 25 July 2022 17:00 (15 minutes)

There are currently multiple available neutron monitor (NM) databases which host and distribute measurements of the total of 147 NM stations. These databases include the World Data Center for Cosmic Rays (WD-CCR), the Neutron Monitor Database (NMDB), the Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radiowave Propagation (IZMIRAN) and individual station/institution databases.

Upon further analysis of these datasets, it is evident, that in most cases the databases host different versions of the datasets for individual stations. This is very problematic for data users, who are not aware of differences in the datasets. It also puts the reliability and reproducibility of scientific results at risk, since analyses in different studies might operate with different versions of the data. Documentation of the datasets is often lacking, with procedures for correcting errors or other problems missing.

We have analysed the 1-hour NM measurements of 147 individual NMs to determine the recommended data sources to use for each station. These recommendations were constructed by selecting a baseline of long-lived good quality “prime” stations, to which the individual datasets were compared. During the study, the basic information of all the stations (latitude, longitude, rigidity-cutoff, etc.) was collected in a single excel file, freely available to all users.

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Session Classification: Parallel 2

Track Classification: SH