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## The not so standard Neutron Monitor: An initiative for standardization and the PHENOMENON Package

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Neutron monitors (NMs) continuously record the cosmic-ray (CR) primary intensity for more than 50 years. Since the International Geophysical Year (IGY) 1957, the IGY NM quickly became recognized as an efficient detector for the study of CRs with a world data center (WDC) for CRs, which provides one hour averages of CR intensities, being established that same year.

The successor of IGY was the super NM64 which is used until today.

In the 1990's NMs followed the revolution of the new technology and started publishing real-time data via the internet.

In recent times, an initial effort to bring together as many NMs as possible and store their data into a database (i.e. NMDB; <http://nmdb.eu>) has grown into a global one, providing 1-minute data in a standard format.

The processing of the NM data is often necessary in order to achieve high quality and to implement real time tools.

This is not a trivial task, and different NMs apply different procedures.

Hence, in this work we present the first step of a larger effort to implement a package of correcting algorithms in open source Python scripts, distributed freely to the NM community via NMDB,

aiming to open the discussion on the standardization of the processes for the corrections of NM data and to provide all parts of such a standard data processing procedure.

The package as a whole, is entitled PHENOMENON (PytHon corrEctioN algOrithMs for nEutroN mONitors).

In what follows, we describe and inter-compare three basic algorithms used in NMs:

- (i) the Simple Sum algorithm;
- (ii) the Median Editor algorithm;
- (iii) the Median plus  $\sigma$  algorithm,

providing, example implementations of all algorithms, as well as, tests with different input data.

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