

FUTURE OF THE WORLDWIDE NETWORK OF NEUTRON MONITORS. C. T. Steigies¹, ¹Institut für Experimentelle und Angewandte Physik, Christian-Albrechts-Universität zu Kiel, Leibnizstrasse 11, D-24118 Kiel, GERMANY, steigies@physik.uni-kiel.de.

Introduction: Neutron Monitors are providing valuable input for space weather services. With the creation of the real-time neutron monitor database (NMDB) several space weather services, like the ANEMOS GLE Alert from the National and Kapodistrian University of Athens or the AVIDOS application providing radiation dose estimates at aircraft altitudes from Seibersdorf Laboratories have been made possible. Also other disciplines like hydrology with their cosmic ray soil moisture observing system (COSMOS) make heavy use of NMDB data.

Several Neutron Monitors have been operating for over 50 or even 60 years. While some of the hardware has been upgraded to enable them to provide realtime data, other parts of a station like the counter tubes and the pre-amplifiers are often still the original parts from the “new” design of the NM64. These stations need to be converted to the state of the art again with easily maintainable hardware before the last of the original scientists, engineers and technicians are all retired. As soon as all the people who still know the intricate details of their Neutron Monitor station are all gone, every small hardware problem may cause a station to be permanently lost from the worldwide network of neutron monitors, or require a significant amount of funding to bring them back to operation.

New hardware needs to be affordable for the stations, as many lack major sources of funding. The hardware designs have to be based on currently available standard parts, that will still be available for a long time, or easily replaceable. Registration systems need to be designed keeping in mind that standard interfaces (ISA and PCI) are changing and disappearing faster than ever before.

Some stations have replaced their registration systems with commercial off the shelf parts, which is a quick and affordable solution, but may cause problems in the future, when replacement parts are no longer available or rely on obsolete interfaces or operating systems. Thus new hardware designs should be made freely available (open hardware) so that they can be adjusted to developing technology standards. They should be flexible so that they can be connected to PCs using interfaces that will hopefully be available for a long time, like serial, USB, or Ethernet. They should not depend on specific versions of operating systems on the PCs but rather use open standards.