The updated and upgraded SANAЕ neutron monitor

Du Toit Strauss, Corrie Diedericks, Cobus van der Merwe, Katlego Moloto

Center for Space Research, North-West University
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– During the last years we have developed a so-called mini-neutron monitor (mini-NM)
– a smaller version of the standard NM (∼ 250 kg)
– mobile; can be placed in remote areas
– several deployed world-wide (Mexico, Saudi Arabia, Polarstern, Neumayer, Concordia; two versions)
– completely designed and built at the NWU
– developed a new and compact “electronics head"
– designed in a modular fashion

– powered by a single 5V transformer (i.e. cellphone charger)

– HV supply up to 4kV

– 2 X BMP180 pressure, temperature, and humidity probes

– sampling rate of 2MHz (500ns samples)

– Controlled by Raspberry Pi with all scripts in Python

– SSH access and screen and keyboard on-site

– GPS timing option

– versatile and adaptable; can even be scaled up to NM64s?
To summarize:
– We’ve upgraded the SANAE NM with electronics from the mini-NM
– Seems like a reliable system and data looks fine
– System is monitored and operated remotely; hardware changes are plug-and-play
– A lot of data analysis and physics to be done...

For future:
– Tubes 1 – 3 will have to be moved to become wax-tubes
– If you want to test the hardware and/or have ideas about analysis to be done we should talk at some point...
– The “worst-case” SANAE monitor works and is operated on a ∼ 0 $/ZAR/EUR/GBP budget. Could we bring other stations back to life using a similar system?

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