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The Advanced Neutron Spectrometer for Manned Exploration

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An Advanced Neutron Spectrometer (ANS) is being developed to measure neutron spectrum in support future manned exploration mission. A prototype instrument has been designed and is being fabricated for a technology demonstration on board the ISS starting in 2016. The ANS measurement technique offers an improvement over the existing gate and capture method employed in boron dope plastic scintillators. The ANS uses a composite scintillator fabricated with 99% plastic scintillator (PVT) and a small amount of scintillating glass fibers (1% by volume) doped with Lithium. The timing characteristics of the two scintillators are sufficiently different to readily identify which component generated any light pulse. This difference is exploited to provide clear identification of the signal generated through neutron moderation in the PVT and the capture of the thermalized neutron in the glass fibers. Test exposures using mono-energetic neutron beams are planned for PTB and a space based exposure is planned for late 2016 on the ISS. The technique and status of this development will be discussed.

Author: Dr CHRISTL, Mark (Marshall Space Flight Center - Nasa)

Presenter: Dr CHRISTL, Mark (Marshall Space Flight Center - Nasa)

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