Contribution ID: **23** Type: **Oral**

Monitoring of targets for radionuclide production

Tuesday, 19 March 2019 14:30 (30 minutes)

Direct monitoring of targets for isotope production implies harsh conditions with large neutron and gamma fields. These have implications on the type of instrument to use and how to extract information. Micro fission pocket detectors for nuclear power generation applications, for example, can sustain neutron fluxes in the order of 1014n/cm2/s or more. This makes them suitable to quantify neutron/gamma fluxes in real time but spectroscopic information is not accessible. An alternative was implemented at iThemba LABS to monitor leakage of radionuclide within the water cooling system. Water is sampled after the bombardment target and circulated in front of a germanium detector. Even though the conditioning and transport of water imply delays, the specific transition lines identified in the gamma spectrum allow for fine diagnostics of the bombardment targets. This can be used to deduce the type of target being bombarded, monitor its condition and identify anomalous leakage. Ultimately, this can also be used to measure the integrated number of projectiles complementary to indirect beam current measurement using non destructive probes.

Primary authors: PAPKA, Paul (Stellenbosch University); STODART, Nieldane; CALLAGHAN, Casey; QHOBOSHEANE, Sehlabaka (NRF/iThemba LABS)

Presenter: PAPKA, Paul (Stellenbosch University)

Session Classification: Metrology & Applications

Track Classification: Metrology and Applications