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Investigation of emission of 37Ar from all nuclear research reactors worldwide

37Ar is an indicator of an underground nuclear explosion in on-site inspection. This radioisotope is produced via 40Ca (n, α) 37Ar reaction through neutron activation of 40Ca included in the rocks near to the nuclear explosion location. The relatively long half-life of 35 days compared to short-lived CTBT-relevant radioxenon isotopes results into 37Ar activity becoming stronger than radioxenon activity approximately 50 days post-detonation. In addition to nuclear explosions, 37Ar can also be produced via neutron activation of air within a neutron emitting facility such as nuclear power plants, research reactors. In recent years, efforts were started to investigate the contribution of specific sources to the radiargon background. In this presentation, the emission of 37Ar from research reactors is investigated based on specific reactors and then extrapolated to all nuclear research reactors worldwide.

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