

and Artificial Argon-37/Argon-39 Signatures in the Underground

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In the case of an underground nuclear explosion, Ar-37 and Ar-39 are produced in rocks by neutron activation of Ca and K, respectively. Because of the very different half-lives of Ar-37 and Ar-39, the Ar-37/Ar-39 ratio in the subsurface is a function of the timing of production (pulsed vs. continuous), depth-dependent production mechanisms, and the Ca/K ratio of the rocks. The Ar-37/Ar-39 ratio can be used as an indicator of whether a measured radio-argon signature from the underground originates from a recent or ancient underground nuclear explosion or is of natural origin. In this poster, we compare calculated natural Ar-37/Ar-39 production depth profiles with data obtained from several groundwater studies in different geological settings.

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Promotional text

The poster combines new production calculations of Ar-39 and Ar-37 including muon reaction with measurements in different depths and different rock formations.

Oral preference format

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