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Ratio Estimation Based on Activity Concentration Profile and Decay Correction During Sampling for CTBT-Relevant Radionuclides with a Short Half-Life

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lightning Talks
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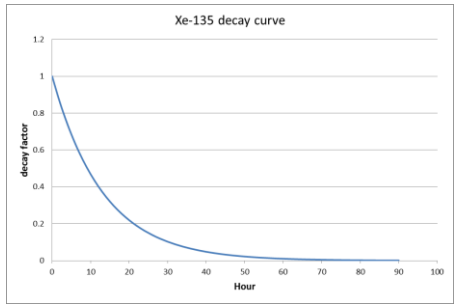
The decay correction on isotopic ratios from activity concentrations in a plume to activities in a sample is estimated based on the assumption of concentration profile

- The activity collected in a sample is derived based on ordinary differential equations of activity decay and accumulation in the sample collection duration.
- Ratios of activity concentrations in the plume ($R(t_2)$) is only dependent on decay constants.
- Ratios of activities collected in the sample ($R_s(t_2)$) is dependent on not only decay constants (λ_1, λ_2) but also on collection time (τ_c).

$$R(t_2) = \frac{C_2(t_2)}{C_1(t_2)}$$

$$R_s(t_2) = \frac{A_{s2}(t_2)}{A_{s1}(t_2)}$$

Sampling: Constant concentrations



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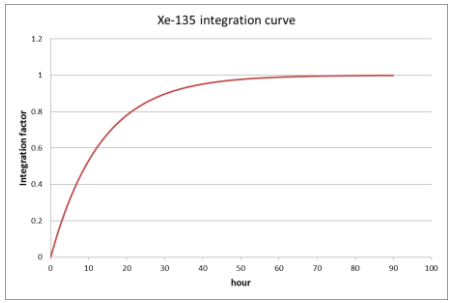

$$R_s(t_2) = R(t_2)\frac{\lambda_1}{\lambda_2}\frac{1-e^{-\lambda_2\tau_c}}{1-e^{-\lambda_1\tau_c}}$$

If you want to learn more about this, come see my e-poster during session 2.4 on Wednesday 21st or access it online on the SnT2023 Conference platform!