

## Calculation of Detection Efficiency of Horizontal Large Volume Source Using Exvol Code

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**Abstract :** To calculate the full energy (FE) absorption peak efficiency for arbitrary volume sample, we developed and verified the EXVol (Efficiency calculator for EXtended Voluminous source) code which is based on effective solid angle method. EXVol is possible to describe the source area as a non-uniform three-dimensional (x, y, z) source. And decompose and set it into several sets of volume units. Users can equally divide (x, y, z) coordinate system to calculate the detection efficiency at a specific position of a cylindrical volume source. By determining the detection efficiency for differential volume units, the total radiative absolute distribution and the correction factor of the detection efficiency can be obtained from the nondestructive measurement of the source. In order to check the performance of the EXVol code, Si ingot of 20 cm in diameter and 50 cm in height were used as a source. The detector was moved at the collimation geometry to calculate the detection efficiency at a specific position and compared with the experimental values. In this study, the performance of the EXVol code was extended to obtain the detection efficiency distribution at a specific position in a large volume source.

**Keywords :** attenuation, EXVol, detection efficiency, volume source

**Conference Title :** ICNTRM 2018 : International Conference on Nuclear Tracks and Radiation Measurements

**Conference Location :** Kyoto, Japan

**Conference Dates :** November 15-16, 2018