**Calibration of Diamond Detector with Am-241 Alpha Source**

# Objective:

Calibrate the synthetic diamond detector using an Am-241 alpha source, confirming detector sensitivity.

# Equipment & Materials:

* Am-241 alpha source (3.29 kBq, 100x100 mm²)
* Synthetic diamond detector (with LiF converter and gold metal contact)
* C2 Broadband Current Amplifier (2 GHz, 40 dB)
* Oscilloscope (connected to a laptop running MATLAB script)
* New signal cables
* Mounting setup (stand)
* PPE: Gloves, lab coat, eye protection

# Test Procedure:

* Replace old cables with new ones.
* Set up the oscilloscope settings.
* Position the Am-241 source close to the detector’s active area, minimizing air gap.
* Connect the detector to the C2 amplifier, then connect the amplifier output to the oscilloscope.

Data Acquisition:

* Power on the system and begin data collection with the MATLAB script.
* Record signal data for at least 10 minutes.
* Review signal response, on alpha particle peak detection (5.486 MeV).

# Risk Assessment:

* Safely store the Am-241 source in its designated shielded container.
* Disconnect equipment and store it properly.

## Hazards:

1. Radiation exposure from Am-241 alpha source.
2. Electrical hazards from powered equipment (amplifier, oscilloscope).
3. Trip hazards from cables and setup arrangement.

## Radiation Safety:

* Use a sealed source container when not in use.
* Maintain safe handling procedures (minimal handling time, appropriate shielding).
* Monitor exposure with a personal dosimeter (if available).

## Electrical:

* Inspect cables and connections for damage before powering on.
* Avoid handling live cables and equipment with wet hands.