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## Simulation and Optimization of a Neutron Backscattering Analysis Set-Up Using MCNP5 Code

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A neutron back scattering set-up for analysis of hydrogenous sample materials has been simulated using MCNP5 neutron and photon transport code. The set-up is mainly composed of an Am-Be neutron source of 37.2GBq and a He-3 neutron gas detector which are embedded in polyethylene bloc, the latter acting as a reflector. The modelisation used in the simulation was validated comparing thermal neutron flux calculated values with measured ones using indium activation foils and He-3 neutron detector. Then, calculations were carried out to determine optimal dimensions of the reflector and the sample holder with the constraint that the neutron and gamma doses must be at acceptable levels. We have also studied the response of the set-up for other reflector materials such as wax and Perspex. Finally, the analysis of organic samples was simulated and the calibration curves were determined for hydrogen and (C+O/H) ratio. The simulated calibration curves were then compared with those experimentally determined

### Country/Organization invited to participate

Algeria

**Primary author:** Mr IDIRI, Zahir (Centre de Recherche Nucleaire d'Alger, 02 Bd Frantz Fanon, BP399, Alger--Gare, Algeria)

**Co-authors:** Mr MAZROU, Hakim (Centre de Recherche Nucleaire d'Alger, 02 Bd Frantz Fanon, BP399, Alger-Gare, Algeria); Ms TAIBOUNI, Nabila (Universite Houari Boumediene des Sciences et de la Technologie, Bab Ezzouar, Algeria); Ms BELOUADAH, Naima (Université des Sciences et de la Technologie, Bab Ezzouar, Algeria)

**Presenter:** Mr IDIRI, Zahir (Centre de Recherche Nucleaire d'Alger, 02 Bd Frantz Fanon, BP399, Alger-Gare, Algeria)

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