



Numerical simulation of pulsed neutron induced gamma log using Monte Carlo method

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Recently the neutron induced gamma log is the key role in shale play. This study was performed for understanding an energy characteristics spectrum of neutron induced gamma log using Monte Carlo method. A neutron generator which emits 14 MeV neutron particles was used. Flux of thermal neutron and capture gamma was calculated from detectors arranged at 10 cm intervals from neutron generator. Sandstone, limestone, granite, and basalt were selected to estimate and simulate response characteristics using MCNP. Also, the design for reducing effects of natural gamma (K, Th U) and back scattering was also applied to the sonde model in MCNP. Through results of energy spectrum analysis of capture gamma which detected to the detector in numerical sonde model, we knew that atoms which have wide neutron cross-section and are abundant in formation such as calcium, iron, silicon, magnesium, aluminium, hydrogen, and so forth were detected. Those results can help to design the optimal array of neutron and capture gamma detectors.