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Contribution ID: **3503** Type: **Poster Competition (Graduate Student) / Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

(G*) (POS-62) A comprehensive Monte Carlo simulation of the neutron response of multi-element microdosimetric detectors based on thick gas electron multiplier.

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The neutron dose responses of the tissue equivalent multi-element Thick Gas Electron Multiplier (THGEM) microdosimetric detectors have been computed by Monte Carlo simulations. The absence of wire electrodes in THGEM has immensely simplified the construction of multi-element detectors. Three muti-element configurations of 7x3, 19x5, 37x7 were used as the representative detector geometries and the microdosimetric response of each configuration was computed by the MCNP 6.2. code. The dimensions of the three configurations were kept such that each configuration occupies a cylindrical volume of 5 cm diameter by 5 cm length. The incident neutron energy was varied from 10 keV to 2 MeV. The angular response was studied for incident neutron beam at angle 0^0, 30^0, 45^0, 60^0, and 90^0.The simulated response showed a good agreement with the evaluated fluence-to-kerma conversion coefficients in the neutron energy region 10 keV to 100 keV while discrepancies were observed in the region above 250 keV. It was identified that the discrepancy was caused by the non-tissue equivalent response of the THGEM. This under-response can be corrected by applying a correction factor. The angular response simulation result showed an excellent uniform response.

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