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Neutronic anisotropy around a radiotherapy treatment field by passive detectors

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Giant-dipole- resonance photoneutrons (GRN) are produced by LINAC 2300 CX operating in the range of 15 MV. During radiotherapy treatment unwanted neutron dose is delivered to patients. To establish the thermal and epithermal photo-neutrons field during radiotherapy treatments Nuclear Track Methodology (NTM). The well tested polyallyldiclogola carbonate (PADC type CR-39 TM on that a thin boron film is deposite to convert neutrons in charged paticles by 10 B(n,α) reaction are employed. The passive device register with efficiency charged particles as a damaged volume these are visible after chemical etching (6N, NaOH, 70 o C) under light transmission microscope (10 x 40).
Tracks of the order of micrometers are visible and their diameters are measure to determine track densities and histogram bars. These provide information on the neutron intensity and energy groups.
Enhancement effects are observed on absorbed dose due to both scattered photo-neutrons and (γ,n) reactions and a relatively good response is observed for mixed radiation field. To solve the difficulty in measuring the photoneutron spectra that is produced from the head of the LINAC due to very intense gamma irradiation, can be used this metodology for stablish the energies of neutrons
and is corroborated by MCNPX the neutron spectra, establishing the additional dose that is attributed to the neutron component.

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