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Reaction rates determination using Monte Carlo simulations for the Bi target at 90 MeV neutron energy.

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Abstract content
 (Max 300 words)
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The iThemba LABS neutron beam facility (D-line vault) can produce quasi mono-energetic neutron beams in the energy range 30 - 200 MeV using lithium (Li) or beryllium (Be) targets, i.e. (p, n) reactions. Recently, various foils were activated at the neutron beam facility using 90 and 140 MeV neutrons and are currently being analysed using gamma-ray spectroscopy method. These measurements campaign are part of the study to improve and extend the International Reactor Dosimetry Fusion File (IRDF) evaluated cross-section library. Contribution from iThemba LABS will add to the library the high threshold reactions (n, 3-6n) with cross sections peaks located between 40 and 200 MeV to meet the requirements of the higher energy nuclear installations. In parallel with the gamma-ray spectra analysis, studies using Monte Carlo simulations are being conducted to determine the reaction rates in all target materials used. The main aim of these investigations is to examine the dominant and competing reactions possible at these high neutron energies. For this contribution, reaction rates calculated using Monte Carlo simulations for ²⁰⁹Bi(n,x) reactions with 90 MeV neutrons will be presented.

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