

Simulation dataset for the neutron subsystem of MIDAS  
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#### General Information

The simulation results for the neutron subsystem of the MIDAS dosimeter were produced with the GATE front-end which is based on the Geant4 toolkit.

The core for the simulation is the scintillator EJ276 of Eljen Technology. A series of monoenergetic neutron beams were generated by GATE (1-20MeV, 0.1MeV step) that vertically impinged the MIDAS dosimeter where the energy deposition per event (Edep) in the scintillator is calculated. Due to the high volume of generated data (17.2GB on root files), every Edep is calculated and stored on a separate ASCII file. These files (or dataset) are used for the analysis of the neutron subsystem. In addition, the dataset contains the measurement results from an Cf252 isotope source (ExpData.ods). In this file, the energy measured in adc channels via a SiPMT (MeVee) is transformed in energy deposition inside the scintillator (MeV) by taking into account the SiPMT saturation and the Birks conversion coefficients for protons. Finally, the deposited energy is reconstructed with the use of the above simulated Edep files and compared to the ISO Cf252 energy spectrum.

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