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Calculation of in-target production rates for radioactive isotope beam production at TRIUMF FATIMA GARCIA, CORINA ANDREOIU, Simon Fraser University, PETER KUNZ, AURELIA LAXDAL, TRIUMF — Rare Isotope Beam (RIB) facilities around the world, such as TRIUMF[1], work towards development of new target materials to generate exotic species. Access to these rare radioactive isotopes is key for applications in nuclear medicine, astrophysics and fundamental nuclear science. To better understand production from these and other materials, we have built a computer simulation of the RIB targets used at the TRIUMF Isotope Separation and ACceleration (ISAC) facility, to support new target material development. Built at Simon Fraser University, the simulation runs in the GEANT4[2] nuclear transport toolkit, and can simulate the production rate of isotopes from a given set of beam and target characteristics. The simulation models the bombardment of a production target by an incident high-energy proton beam and calculates isotope in-target production rates different nuclear reactions. Results from the simulation will be presented, along with an evaluation of various nuclear reaction models and a experimentally determined RIB yields at the ISAC Yield Station[3].

[1]TRIUMF, Canada's National Laboratory for Particle and Nuclear Physics, Vancouver BC
[2]Agostinelli, S. et al., Nuc. Instrum. Meth. A 506 (2003) 250-303
[3]Kunz, P. et al., Rev. Sci. Instrum. 85 (2014) 053305

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