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The $d + {}^7\text{Be}$ reaction to study the cosmological lithium problem

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It is well known that there is a serious anomaly between the observed and Big Bang Nucleosynthesis predicted abundance of ${}^7\text{Li}$. Since the ${}^7\text{Li}$ abundance is known to be intimately related to the production and destruction of ${}^7\text{Be}$, it is pertinent to study reactions involving ${}^7\text{Be}$. An experiment measuring the transfer reaction ${}^7\text{Be}(d,p){}^8\text{Be}^*$ at $E = 5 \text{ MeV/A}$ (IS 554) at CERN-HIE-ISOLDE is scheduled in November 2018. Detailed study of this ${}^7\text{Be}$ destruction reaction is required before one can invoke solutions of the ${}^7\text{Li}$ problem beyond nuclear physics, particularly in the context of the newly conjectured light electrically neutral particles X. We would utilize the scattering chamber installed in the third beamline of the HIE-ISOLDE facility, having sets of DSSD in a pentagon geometry. Detailed Geant4 simulations in the NPTool framework have been carried out. Reports on the experiment would be presented.

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