

Abstract Submitted  
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**Search for Light Dark Matter at the ICARUS T-600 Detector with the NuMI Beam: Status of Simulation Studies.**<sup>1</sup> HECTOR CARRANZA, JAEHOON YU, University of Texas at Arlington, ANGELA FAVA, Fermilab Scientist, WOORYOUNG JANG, University of Texas at Arlington, PEDRO MACHADO, KEVIN KELLY, Fermilab Theoretical Scientist — The ICARUS T-600 detector is a Liquid Argon Time Projection Chamber (LArTPC) that is capable of 3D reconstruction of particle tracks with a  $O(1 \text{ mm})$  resolution and particle energy reconstruction with a threshold of 200 MeV inside the active volume. It is presently installed on the surface at Fermilab as part of the Short Baseline Neutrino Program, exposed on-axis to the Booster Neutrino Beam (BNB) and 6 degrees off axis to the Neutrinos from the Main Injector (NuMI) beam. As theoretical studies on light dark matter (LDM) resulting from mesons coming from beam-target experiments show, there is a maximum LDM to neutrino background ratio at around 6 degrees off-axis. Experimental studies of LDM resulting from the processes  $\text{pion}^0(\text{eta}^0)$  to photon + dark photon to photon + DM pair at the ICARUS detector are highly favored. Here I will present the expected sensitivities for such searches for various LDM parameter sets on the process DM + electron to DM + electron, using a full simulation chain, consisting of a custom DM flux generator, GENIE's LDM- $e^-$  interaction simulator, and ICARUS's LArSoft detector simulation code.

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