Search for Light Mass Dark Matter using Leptophilic Gauge Bosons Model in Neutrino Experiments Like DUNE and Mini-BooNE GAJENDRA GURUNG, University of Texas at Arlington, FRANCESCO CAPOZZI, Center for Neutrino Physics, Department of Physics Virginia Tech, BHASKAR DUTTA, Mitchell Institute for Fundamental Physics and Astronomy, Texas A M University, WOOYOUNG JANG, University of Texas at Arlington, IAN SHOEMAKER, Center for Neutrino Physics, Department of Physics Virginia Tech, ADRIAN THOMPSON, Mitchell Institute for Fundamental Physics and Astronomy, Texas A M University, JAEHOON YU, University of Texas at Arlington — The search for Dark Matter is a well-motivated effort in high energy physics and cosmology. One of the promising anomaly-free models which fit the description of Light-Mass Dark Matter is an extension of the Standard Model featuring a light gauge boson Z'. This boson, Z' weakly couples with the leptons by gauging $L_\mu - L_e$, $L_e - L_\tau$ and $L_\mu - L_\tau$. Such a Low-Mass Z' is also able to explain the measured value of the muons anomalous magnetic moment. We look at the production of Z' through meson decay, proton bremsstrahlung, and resonant on shell production. In this model, Z' undergoes mixing with photons and further decays into $e^\pm$ and $\mu^\pm$. Therefore, we use the existing beam dump data from MiniBooNE and simulation study of DUNE to probe the understanding of Dark Matter, through achieving competitive constraints on the gauge coupling parameter $g_{Z'}$ of Z'.

Gajendra Gurung
University of Texas at Arlington