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A study of charged kaon-nucleon total interaction cross section in liquid argon.

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We present a study of the charged kaon-nucleus total interaction cross section in liquid argon performed at the LArIAT experiment. The kaon-nucleus total interaction cross section has never been measured before in argon and it is fundamental to shed light on light meson interactions in nuclei. Additionally, this measurement provides a key input to proton decay studies in future Liquid Argon Time Projection Chamber (LArTPC) experiments such as DUNE.

LArIAT is a small LArTPC deployed in a calibration test beam line at Fermilab. The LArIAT beam line detectors allow identification of kaons in the beam and measure their momentum before entering the TPC. The precise calorimetric energy reconstruction and excellent tracking resolution of the LArTPC technology enables the measurement of the total differential cross section for the tagged kaons.

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