

Abstract Submitted  
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**A New Cubic Meter Scale Neutrino Detector for Seeking Sterile Neutrino Signatures at a Reactor** JOHN LEARNED<sup>1</sup>, University of Hawaii, R. BRUCE VOGELAAR<sup>2</sup>, Virginia Tech, MINI-LENS COLLABORATION, MINITIMECUBE COLLABORATION — We describe a new type of detector under construction to study electron anti-neutrinos a few meters from a nuclear reactor to look for oscillations, potentially due to sterile neutrinos, and addressing the “Reactor Neutrino Anomaly.” This detector is made possible by a natural synergy between the miniTimeCube and mini-LENS programs. It features a “Raghavan Optical Lattice” (ROL) consisting of cubical cells filled with liquid scintillator (doped to improve neutron detection). Cell walls are thin acrylic planes with a low-index film, resulting in total internal reflection guiding most of the light down the 3 cardinal directions. The six orthogonal photomultiplier tubes efficiently collect light from each cell, allowing event topology determination on a cellular level, and vertex resolution to about one cm using timing. The resulting excellent spatial and energy resolution, coupled with event topology, allows discerning the inverse beta decay signal, and the putative oscillation pattern, even in the presence of other backgrounds. We will discuss venues, efficiency, sensitivity and status of the project.

<sup>1</sup>(for the miniTimeCube collaboration)

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