

The HUNTER Sterile Neutrino Search

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The HUNTER experiment (Heavy Unseen Neutrinos from Total Energy-momentum Reconstruction) uses missing-mass reconstruction of electron-capture beta decays to search for sterile neutrinos with masses in the 20-280 keV range. We study electron-capture decays of radioactive ^{131}Cs atoms, contained in a magneto-optical (laser) trap (MOT). The recoil ^{131}Xe nuclei and the Auger electrons will be measured with part-per-thousand resolution and up to 4π collection efficiency using precision MOTRIMS spectrometers. K x-rays will be detected in a YAP scintillator array. The HUNTER vessel has passed UHV tests, and the loading MOT adapted for use with radioactive ^{131}Cs has been tested with inactive Cs. Mounting of detectors is in progress now at the UCLA experiment site. The apparatus also makes possible other sensitive searches for BSM physics in beta decays.

Talk presented for the HUNTER Collaboration. We thank the W. M. Keck Foundation, the Gordon and Betty Moore Foundation, and our respective universities for financial support of HUNTER.

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