

Abstract Submitted
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Towards the in-situ detection of a single He2* excimer in superfluid helium FAUSTIN CARTER, SCOTT HERTEL, MICHAEL ROOKS, DANIEL PROBER, DANIEL MCKINSEY, Yale University — Incident radiation can excite superfluid helium into a diatomic He2* excimer, which decays through the emission of a 15 eV photon. Such excimers have been used as tracers to measure the superfluid's quantum turbulence, thanks partly to the long half-life of the He2* triplet state (13 seconds). However, the efficient detection of these excimers remains a challenge. We present a detector capable of in-situ detection of the He2* excimers either directly (the excimer collides with the detector), or by collecting the 15 eV photon emission upon decay. This detector is based on a tungsten superconducting transition edge sensor and is designed to operate near 100 mK in a dilution refrigerator. We will discuss operating characteristics and present preliminary data with an aim towards the detection of a single excimer.

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