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TESSERACT: light dark matter search with transition edge sensors and multiple targets

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The TESSERACT collaboration searches for light dark matter particles (MeV to GeV) through interactions with various target materials and the transition edge sensor (TES) readout. The project includes HeRALD and SPICE experiments with superfluid helium and polar crystal targets, respectively. Recently, we have achieved several R&D milestones. We built crystal detectors with eV to sub-eV energy resolutions. These detectors have sensitivity to $O(10)$ MeV dark matters. We identified the stress-induced low-energy events as a main background source in our detectors. We also detected quantum evaporation signals from a stably operated superfluid helium detector. Finally, I'll discuss our plans for a full-scale underground package.

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