

# Progress of kinetic inductance detectors on CaF<sub>2</sub> for astroparticle physics

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Kinetic Inductance Detector (KID) is an exciting device that promises high sensitivity, large format, and sub-millimeter waves for X-ray imaging arrangements for astrophysics. The KID consists of a superconductor thin film microwave resonator combined with a transmission line. When energy accumulates, Cooper's pair in superconductor films break, producing a quasi-particle. This change increases the kinetic induction in the resonant circuits and can be monitored by the transmission line. Lumped element KID (LEKID) is applied to CaF<sub>2</sub> crystals as a substrate in our experiment. <sup>48</sup>Ca is one of the double-beta decay nuclei, and <sup>19</sup>F is sensitive to spin-dependent elastic scattering with dark matter. The LEKID on CaF<sub>2</sub> can be cooled to 10mK. At this stage, the quality factors of the LEKID are about  $400 \times 10^3$  and measurement for particle detection using <sup>241</sup>Am particle irradiation also demonstrated at this low temperature.

## TIPP2020 abstract resubmission?

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