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## Development of large array of Kinetic Inductance Detectors using commercial level foundry

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We will report Kinetic Inductance Detectors(KIDs) fabricated on a 6in and an 8in process in an external foundry. These processes allow us to fabricate large arrays of KIDs.

Increasing the number of superconducting detectors strongly supported a wide variety of astronomical observation and particle physics experiment. Actually, the sensitivity of the CMB measurements is exponentially improved in the past few decades. And the superconducting detector is also employed in dark matter search experiment to search light dark matter which is hard to detect with the conventional detector. A large array allows us to make a large volume dark matter detector and improve the sensitivity to dark matter. A large array of superconducting detectors is able to improve not only CMB experiments but also such experiments. The biggest advantage of Kinetic Inductance Detectors(KIDs) is scalability to a large array thanks to the intrinsic frequency multiplexing scheme. As a first step, test chips are designed to check the performance of the 6in and the 8in MEMS processes. The KIDs are made of single pure aluminum film. The KIDs are consist of CPW quarter wavelength resonators with feed line. The chip size is 20mm x 20mm chip. Approximately 10 to 100 resonators are fabricated on each chip.

We will report the result of the initial measurement.

### **Student (Ph.D., M.Sc. or B.Sc.)**

N

### **Less than 5 years of experience since completion of Ph.D**

Y

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