

Quantum Technologies within INFN: status and perspectives



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The SIMP project

New technologies and skills are needed to face future challenges of fundamental physics, ranging from understanding the nature of Dark Matter to fundamental problems of Quantum Field Theory. The low-mass frontier of Dark Matter, the measurement of the neutrino mass, the search for new light bosons in laboratory experiments, all require detectors sensitive to excitations of meV or smaller. The project objective is the development of SIngle Microwave Photon (SIMP) sensors to strengthen INFN skills and technologies for facing these challenges.

The SIMP Project, a collaboration among researchers of INFN, CNR, FBK and INRIM, proposes two solutions for photodetectors:

1. Current Biased Josephson Junction (10-50 GHz)
2. Transition Edge Sensor (30-100 GHz)

We will discuss the solutions identified to develop the sensors, outline the program for the next years, and report the progress made during the first year of activity.

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