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## TES Detector for the ALPS II Experiment

*Tuesday, 23 July 2019 18:45 (15 minutes)*

The Any Light Particle Search II (ALPS II) is an experiment at DESY, Hamburg that utilizes the concept of resonance enhancement to improve on the sensitivity of traditional light shining through a wall style experiments. Such experiments attempt to detect photons passing through an opaque, light-tight barrier by converting to relativistic, weakly interacting sub-eV particles and then reconvert to photons. The detection of these photons requires a detector capable of observing the extremely small rates, of the order of  $10^{-5} \text{ s}^{-1}$ . Thus the detector must have a low dark count rate as well as a high detection efficiency. This should be achievable with a transition edge sensor (TES), i.e. a cryogenic calorimeter, which exploits the drastic dependence of a material's electrical resistance on the temperature in its transition region. One major experimental challenge in utilising a TES, among others, is the suppression of background dominated by blackbody radiation to a sufficiently low level. The setup of the TES at ALPS II will be presented. The TES is read out using a SQUID mounted to the module housing the TES, kept in a dilution refrigerator. The characterization of the TES and that of the SQUID readout will also be presented. We discuss the current status as well as the first measurements of the detector preparing for data taking starting in 2020.

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

Y

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

Y

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