Abstract Submitted
for the APR14 Meeting of
The American Physical Society

A Template-Matching Method For Measuring Energy Depositions In TES Films BENJAMIN SHANK, JEFFREY YEN, BLAS CABRERA, JOHN MARK KREIKEBAUM, ROBERT MOFFATT, PETER REDL, Stanford University, BETTY YOUNG, Santa Clara University, Stanford University, PAUL BRINK, MATTHEW CHERRY, ASTRID TOMADA, SLAC National Accelerator Facility, SUPERCDMS COLLABORATION — Transition edge sensors (TES) have a wide variety of applications in particle\astrophysics for detecting incoming particles with high energy resolution. In TES design, the need for sufficient heat capacity to avoid saturation limits the ultimate energy resolution. Building on the TES model developed for SuperCDMS by Yen et. al. for tungsten TESs deposited next to aluminum collection fins, we outline a time-domain non-linear optimal filter method for reconstructing energy depositions in TES films. This allows us to operate devices into their saturation region while taking into account changing noise performance and loss of energy collection. We show how this method has improved our understanding of quasiparticle diffusion and energy collection in our superconducting sensors.

Benjamin Shank
Stanford University

Date submitted: 10 Jan 2014 Electronic form version 1.4