Abstract Submitted
for the TSS17 Meeting of
The American Physical Society

Cosmological Signature In Light Mass Dark Matter Searches With Phonon Mediated Detectors FEDJA KADRIBASIC, None — We are presenting a method for using solid state detectors with directional sensitivity to Dark Matter interactions, which provides an excellent tool to discriminate for WIMPs originating from the galactic sources against the irreducible backgrounds including solar neutrinos. There is a large body of literature for high-mass WIMPs detectors with directional sensitivity, in particular those using low-pressure TPC detectors, but there is no available technique to cover WIMPs in the mass range < 500 MeV. We argue that very low temperature phonon-mediated semiconductor detectors, such as those developed for the future low-mass WIMPs search in SuperCDMS and beyond, also allow for directional sensitivity if properly calibrated. We find a signal to noise ratio for WIMPs of Mass <1 GeV large enough to identify the direction of nuclear recoil from WIMP scattering. This provides, for the first time, a straightforward directional sensitivity for low-mass WIMP dark matter.

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Date submitted: 17 Feb 2017 Electronic form version 1.4