Abstract Submitted
for the TSF12 Meeting of
The American Physical Society

Separating Cherenkov and Scintillation Pulse Signals in High Energy Electromagnetic Calorimeters JOHN SANDY, CHRISTOPHER COWDEN, JON CLARK, NURAL AKCHURIN, Texas Tech University — We propose to adapt techniques from the field of signal processing to distinguish between Cherenkov and scintillation light present in high energy electromagnetic calorimeters, such as those employed at LHC detectors. Relativistic charged particles emit Cherenkov radiation when they traverse a medium with a velocity higher than the phase velocity of light in that medium. Some materials commonly employed in high energy physics calorimetry emit scintillation light when a charged particle passes through it. Presently in calorimeters which use these scintillating materials, one cannot always separate the Cherenkov light from the scintillation light in the measured signal even though some techniques exist. Separating the two light signals from a single material requires a large divergence in the time structure or in the wavelength spectra of Cherenkov and scintillation light. This study intends to move from the time domain of the signal into the frequency domain where we split the measured signal and return to the time domain with separate estimates of the Cherenkov and scintillation light signals.

John Sandy
Texas Tech University

Date submitted: 21 Sep 2012 Electronic form version 1.4