Abstract Submitted
for the MAS17 Meeting of
The American Physical Society

Zinc Tungstate Scintillators for Low Energy Electron Microscopy DEREK GROVE, MARIAN TZOLOV, Lock Haven University, NICHOLAS BARBI, OWEN HEALY, PulseTorr LLC — Zinc tungstate is a crystalline material that emits light as result of electron bombardment. We have deposited $ZnWO_4$ films with electrical conductivity enough to prevent charging, photoluminescence quantum efficiency of 23%, which are mechanically durable. This makes it a viable thin film coating for scintillators inside an SEM with the added benefit that it can deliver signal even at low energy of the electrons. Our theory is that zinc tungstate as a thin film on top of scintillators offers more benefits for low energy back scattered electron microscopy than ITO or Al, two materials that do not emit light in the presence of electron radiation. We have taken images at low accelerating voltages with two types scintillators, YAP with a thin film of zinc tungstate on top and YAG with ITO. The comparison shows much higher signal to noise ratio for the scintillator with zinc tungstate, and imaging with it at electron energies, where no image can be collected with the scintillator with ITO. The ability of the zinc tungstate film to prevent charging was confirmed with measurement of the electron emission vs. accelerating voltage. These curves are however, very sensitive to the surface properties of the sample.

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Date submitted: 30 Sep 2017 Electronic form version 1.4