Abstract Submitted
for the SES17 Meeting of
The American Physical Society

Volumetric Radiography of Watermarks[1] RYAN STEMPERT, DANIEL BOYE, Physics Department, Davidson College — We explore the use of the volumetric radiography provided by Digitome in viewing watermarks on paper that are not visible to the unaided eye. The Digitome process uses multiple 2D radiographs taken from different perspectives to generate a user-defined plane of view. The x-ray source has a broadband spectrum generated, typically, from a 40keV electron beam incident upon a tungsten target. Transmission radiographs are captured with a digital radiography plate in communication with a computer. A watermark is a thinner, less dense area within a sheet of paper created by the manufacturer and usually visible by holding the paper up to the light. However, when the paper is mounted to an opaque material, this practice becomes impossible unless the mounting is removed, which can result in damage to the paper. Often, mounted paper and paintings on wood or canvas are not flat. We employed the Extended Depth of Field ImageJ plugin to aid in viewing non-planar objects. By optimizing acquisition and imaging parameters, we are able to discern watermarks through upwards of 40 mils of opaque mounting material, even beneath a layer of text.

[1]Digitome is the registered trademark of the Digitome Corporation. We wish to thank Varex for use of the 2530HE digital imaging plate which made our low-energy exams possible.

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Date submitted: 05 Oct 2017 Electronic form version 1.4