

Abstract Submitted
for the MAS21 Meeting of
The American Physical Society

Particle Tracking Using a Quantum Enhanced Tracker¹ NICOLAS DESTEFANO, SAEED PEGAHAN, IRINA NOVIKOVA, EUGENIY MIKHAILOV, SETH AUBIN, TODD AVERETT, The College of William & Mary — The quantum enhanced tracker is a proposed tabletop prototype to optically trace single particle paths with high resolution in three dimensions. The electrons pass through a volume filled with Rubidium atoms, and their presence perturbs atomic quantum states and can be detected optically. Here, we show preliminary detection of low-energy electrons in two dimensions through a polarization rotation scheme. We plan to measure AC electric field effects on Rydberg states as a sensitive electrometer to detect low-energy particles. This apparatus will be implemented at Jefferson National Laboratory as a pristine method of detecting charged particles based on coherent properties of Rubidium atoms.

¹Laboratory Directed Research Development

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Date submitted: 04 Nov 2021

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