Real time electron counting through wavelet edge detection\textsuperscript{1}
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Wisconsin-Madison — We have recently demonstrated single-shot measurements of
individual electron spins in a Si/SiGe quantum dot. These experiments were an-
alyzed using a wavelet-based technique that allows detection of charging events in
real time. An alternative method, based on level thresholding, is not well suited for
real time detection, due to drifting background currents in the charge sensor. In
contrast, the wavelet technique relies on edge detection and is hence robust against
drifting currents levels. In this talk, we describe our wavelet algorithm and its appli-
cations for charge sensing. We benchmark the performance of the algorithm under
realistic signal noise conditions.

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