

Abstract Submitted  
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**Variation of the shot noise within an ensemble of atomic-scale metal junctions**<sup>1</sup> RUOYU CHEN, DOUGLAS NATELSON, Department of Physics & Astronomy, Rice University — Shot noise originates from the discreteness of charge carriers. In nanoscale systems the noise carries additional information about transmittances of quantum channels beyond the conductance. In previous experiments with mechanical break junctions, we demonstrated that shot noise and its quantum suppression are still robust even at room temperature. In addition to studying the ensemble average of the noise over all the conductance traces involving many junction configurations, we can consider the whole ensemble of measurements. With STM-style gold junctions at room temperature, we present density maps of the noise as a function of conductance. The noise suppression when the conductance is near 1 G0 is still observed in such a map as usual. Furthermore, at that same conductance we observe a pronounced minimum of the noise's variation across the ensemble. We interpret this as experimental evidence that the number of atomic configurations in the ensemble with G near 1 G0 is comparatively reduced.

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