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Water-soluble metallic cluster characterization via nanopore detection CHRISOPHER E. ANGEVINE, JOSEPH E. REINER, Physics Department, Virginia Commonwealth University, Richmond, VA 23284 — Metallic quantum clusters can be ligand stabilized for aqueous environments to expand their potential as biosensors. Characterizing these clusters, while they are in solution, is an important problem because it will aid in optimizing cluster design. Nanopore-based resistive pulse sensing could be a valuable technique with which to characterize these structures because the pore is commensurate with the size of many of the clusters in use. Briefly, a single cluster enters the nanopore and creates a measurable decrease in the ionic current through the pore. These current blockades can be analyzed to deduce properties of the clusters such as size and charge. We have demonstrated this capability with a monodisperse mixture of $Au_{25}(SG)_{18}$. These clusters give rise to blockades with various mean residence times and blockade depths. We will present preliminary results and our analysis of these blockades and discuss future directions for nanopore-based cluster characterization.

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