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Student reasoning about measurement and uncertainty across classical and quantum mechanics

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Measurement and uncertainty are important concepts that show up across a standard physics curriculum, from laboratory instruction to quantum mechanics courses. Little work, however, has examined how students reason about uncertainty beyond the introductory level and has generally focused on a single perspective: students' procedural reasoning about measurements. Our team has developed new ways of looking at students' reasoning about measurement and uncertainty that span these contexts, and also explore students' ideas about sources of uncertainty, predictive reasoning about measurements, and ideas about the existence of "true values". I will present our work exploring the interesting variability in student reasoning across these perspectives, classical and quantum mechanics contexts, and introductory and upper-division students.

Keyword-1

Measurement and uncertainty

Keyword-2

Classical & Quantum Mechanics

Keyword-3

Physics Education Research

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