



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 128

Type: Oral (Non-Student) / Orale (non-étudiant(e))

Reasoning about uncertainty and measurement in classical and quantum mechanics

Wednesday, June 9, 2021 12:15 PM (15 minutes)

Prior research has found limitations in how students reason about uncertainty and measurement in introductory courses, with many students thinking point-like (a single measurement could be the true value) rather than set-like (a set of measurements estimate the parameter). Motivated by the question, “How does that intro-level reasoning influence student thinking about quantum mechanical measurement,” we conducted interviews and surveys to probe student reasoning about uncertainty and measurement across classical and quantum mechanical contexts. The work also aims to characterize the possible paradigms of student thinking about uncertainty and measurement across physics contexts, adding nuance to the point- and set-paradigms.

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Session Classification: W1-3 Quantum I (DPE) / Quantique I (DEP)

Track Classification: Physics Education / Enseignement de la physique (DPE-DEP)