


Research on Student Learning of Mathematics in Physics

 Wed. March 18, 10:30 a.m. — 12:18 p.m.

 Convention Center, Meeting Room 103

Chair: Shams El-Adawy, University of Colorado Boulder

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12:06 — 12:18 p.m.

Impact of physics problem characteristics on problem difficulty

David Meltzer (presenter)



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Physics problems that are intended to assess students' understanding of specific concepts can, from the students' standpoint, vary greatly in difficulty even in cases where an expert might see little difference. In contrast to obvious features such as added problem length or presence of irrelevant information, other, more subtle features can strongly impact students' correct-response rates. As examples, I will present data reflecting significant differences in problem difficulty associated with (1) use of symbols, (2) minor changes in diagrams or wording, (3) multiplicity of relevant variables, (4) need for spatial reasoning, (5) dependence on subtle assumptions or terminology, (6) use of quantities with different defining equations in different contexts, and (7) reliance on unfamiliar or infrequently practiced mathematical skills.

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