

Abstract Submitted
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Core Graduate Courses: A Missed Learning Opportunity?*

ALEXANDRU MARIES, University of Cincinnati, SINGH CHANDRALEKHA, University of Pittsburgh — An important goal of graduate physics core courses is to help students develop expertise in problem solving and improve their reasoning and meta-cognitive skills. We explore the conceptual difficulties of physics graduate students by administering conceptual problems on topics covered in undergraduate physics courses before and after instruction in related first year core graduate courses. Here, we focus on physics graduate students' difficulties manifested by their performance on two qualitative problems involving diagrammatic representation of vector fields. Some graduate students had great difficulty in recognizing whether the diagrams of the vector fields had divergence and/or curl but they had no difficulty computing the divergence and curl of the vector fields mathematically. We also conducted individual discussions with various faculty members who regularly teach first year graduate physics core courses about the goals of these courses and the performance of graduate students on the conceptual problems after related instruction in core courses. *Work supported by the National Science Foundation

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