

Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Network Analysis of Students' Representation Use in Mechanics and E&M DARYL MCPADDEN, ERIC BREWE, Florida International University — In this study, we analyzed the representational tools that students in the Modeling Instruction Introductory E&M (MIE&M) course use on introductory physics problems. Representational competence is a critical skill needed for students to develop and communicate a sophisticated understanding of science topics, particularly in physics where multiple representations are often used within a single problem. The Modeling Instruction curriculum highlights representation development as a part of the modeling process, making the MI-E&M course a rich context to collect data. In the Spring 2015 and Spring 2016 semesters, over 150 students total (from 3 sections of MIE&M) were given a survey of 25 physics problem statements both pre- and post- instruction, covering both Newtonian Mechanics and Electricity and Magnetism (E&M), and asked which representations they would use in that given situation. Using network analysis, we compare how students use representations in Mechanics and E&M contexts.

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Date submitted: 29 Sep 2016

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