**Network Analysis of Students' Use of Representations in Problem
Solving** DARYL MCPADDEN, ERIC BREWE, Florida Intl Univ — We present
the preliminary results of a study on student use of representations in problem solv-
ing within the Modeling Instruction Electricity and Magnetism (MI-E&M) course.
Representational competence is a critical skill needed for students to develop a so-
phisticated understanding of college science topics and to succeed in their science
courses. In this study, 70 students from the MI-E&M, calculus-based course were
given a survey of 25 physics problem statements both pre- and post- instruction,
covering both Newtonian Mechanics and Electricity and Magnetism (E&M). For
each problem statement, students were asked which representations they would use
in that given situation. We analyze the survey results through network analysis,
identifying which representations are linked together in which contexts. We also
compare the representation networks for those students who had already taken the
first-semester Modeling Instruction Mechanics course and those students who had
taken a non-Modeling Mechanics course.

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