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Engaging Students in Authentic Scientific Practices in Physics Lab Courses

Physics is an empirical science. Therefore, learning physics must include learning how to design and conduct experiments, analyze and interpret data, and revise models and apparatus. Physics lab courses at the introductory and upper-division levels are one of only a few opportunities for students to engage in these authentic physics practices. For many students, instructional labs are the only opportunity. However, these courses do not always have the students reach the desired learning goals. Our work looks to improve lab experiences by improving students' competency with modeling of physical and measurement systems, troubleshooting skills, documentation practices, and views of the nature of experimental physics.

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