SES13-2013-000111

Abstract for an Invited Paper
for the SES13 Meeting of
the American Physical Society

Addressing Students' Mental Models of Sound Propagation: Overcoming the Hurdle of Hybrid Mental Models and the Real Time Elicitation

ZDESLAV HREPIC, Columbus State University

While constructing their understanding in various domains of physics, students go through transitional phases that may involve mental models uniquely composed of the most common initial alternative model and, simultaneously, of the elements of the scientifically accepted model. Such cognitive structures may be richly developed and consistently used and have been identified in various physics and science topics ranging from earth science, to electrostatics, Newtonian mechanics and optics. This talk addresses the nature of students' mental models of sound propagation with special considerations of such blend i.e. hybrid models. The nature of hybrid models complicates the process of determining students' mental models through multiple choice inventories. They may necessitate synchronized consideration of multiple questions to determine a student's model in a single context. In the case of sound propagation, three to four different questions (depending on the context) are needed for this purpose. We will show our solution to the problems of addressing and representing hybrid models of sound propagation using a classroom response system in real time. We will also discuss results collected through the developed inventory at high school and college levels.