Abstract Submitted
for the 4CF10 Meeting of
The American Physical Society

Smartphones as Integrated Kinematic and Dynamic Sensors for Amusement Park Physics Applications STEPHANIE PETERSON, J.R. DENNISON, Utah State University — USU has hosted Physics Day at Lagoon and has attracted more than 120,000 secondary educators and students over 21 years. During this educational day, students explore basic physics concepts and apply their classroom content outdoors, in real world applications. As part of the event, USU's Physics Department provides curriculum to be used at Lagoon, in similar outside venues, and in the classroom. One such educational instrument, which is a primary focus of this work, is student workbooks filled with activities ranging from very simple to more advanced topics. Workbooks cover the properties of waves, relative velocity, and acceleration, topics which have historically challenged students and future topics include kinematics, energy, and forces. The topics were selected based on requests from teachers throughout the Intermountain Region and identified deficiencies in student performance on core curriculum assessments. An innovative approach is to identify physical application of iPhone and Android smartphone software technologies, which make use of dynamic and kinematic sensors. These technologies will allow students to realize their ability to do quantitative physics calculations anywhere, anytime; a smart device which is highly salable to today's teenage learners. This also provides an exciting approach to more fully engage students in learning physics concepts.

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Date submitted: 13 Sep 2010 Electronic form version 1.4