

HANDS-ON EXPLORATION OF VIBRATIONS AND RESONANCE THROUGH MOBILE TECHNOLOGY

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This paper presents a teaching experimental project on oscillations designed for physics students. The project aims to help students to study oscillations using the smartphone applications.

The smartphones, with their built-in sensors, are well-suited for use as reliable and versatile tools in simple educational experiments.

In this study, a smartphone is used to measure the vibration frequencies of rods with different lengths. The results obtained with the smartphone are compared with theoretical calculations and the agreement is good. Another experiment is study of phenomenon of resonance with simple laboratory equipments. In this case, another smartphone's application is used to measure the natural oscillations frequency of a system and the frequency of the forcing factor. Again, the results obtained are comparable to theoretical predictions and with a good level of agreement.

In this paper, special attention is paid to the use of the applications "Phyphox" and "Strobe light" and the benefits that students have.

The paper concludes with an evaluation from a pedagogical perspective and provides related recommendations.

Keywords: oscillations, smartphone, sensors, "Phyphox", "Strobe Light", experiment, active learning, autonomous work, resonance, frequency measurement, vibrations, frequency analysis

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