Contribution ID: **720** Type: **Poster**

Measuring sound speed in the air with Phiang Aw flute

Monday 21 May 2018 18:30 (15 minutes)

Sound speed in the air can be measured from resonance phenomena in an open-open tube. In a typical undergraduate laboratory, sound is generated with a specific frequency, and lengths associated with resonance are recorded. Subsequently, those data can be used to determine the sound speed. Instead of using a specialized apparatus, this work demonstrates a method to measure sound speed using Phiang Aw flute and sound spectrum analyzer application on mobile phone. Phiang Aw flute is modeled as an open-open tube: one end is the mouth hole, and the other end is the finger hole. Length of the open-open tube is varied by opening different finger holes. Consequently, the frequencies that resonate with the tube change depending on its length. Resonant frequencies can be found from a sound spectrum analyzer, which typically use Fast Fourier Transform algorithm. Data on tube lengths and associated frequencies are used to determined the sound speed by linear regression. In addition, end correction length is automatically found. The difference between sound speed from this experiment and the adiabatic sound speed can be less than 5%. Therefore, this experiment can be used as a hands-on demonstration in introductory physics classes. Finally, because of its low cost, this experiment can be implemented on virtually every school in Thailand.

Author: Mr WEERAWONGPHROM, Naruepon (Mahidol Wittayanusorn School)

Presenter: Mr WEERAWONGPHROM, Naruepon (Mahidol Wittayanusorn School)

Session Classification: A02:Physics Education (Poster)

Track Classification: Physics Education