

A clamped bar model for the sompoton vibrator

Abstract

The sompoton is one of famous traditional musical instruments in Sabah. This instrument consists of several parts with the vibrator being the most important one. In this paper, the vibrator is modeled as a clamped bar with a uniformly distributed mass. By means of this model, the fundamental frequency is analyzed with the use of an equivalent single degree of freedom system (SDOF) and exact analysis. The vibrator is made of aluminum in different sizes and is excited using a constant air jet to obtain its fundamental resonance frequency. The fundamental frequency obtained from the experimental measurement is compared with the theoretical values calculated based on the equivalent SDOF and exact analysis theories. It is found that the exact analysis gives a closer value to the experimental results as compared to the SDOF system. Although both the experimental and theoretical results exhibit the same trend, they are different in magnitude. To overcome the differences in both theories, a correction factor is added to account for the production errors.