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Study on the Spectrum and Frequency of the Flute Using Computational Simulations and Vibrational Analysis SO MIN LEE, JACK WILINSKY, RISE Group — A sound spectrum shows the amount of sound energy in a given frequency band. It is a reduced sample representation of original frequencies of a sound in terms of decibel(dB) or Pascal. In this paper, acoustical analysis in the frequency and time domain for the flute were conducted. The spectral quality of other musical instruments were also studied to compare each other using computational and physical simulations. Through looking at the spectrum of a musical note and analyzing any of the sound spectra, it was possible to notice that they have a certain number of prominent patterns at a specific set of frequencies. This research observed that the flute shows the purest tones until a certain Hz and fuzzy tones occur after the pure tones. In the spectra, it was possible to notice that the harmonics have patterns and they are equally spaced components. Also, the power or energy of all the harmonics change over time, but the pitch stays almost constant, so the frequencies of the spectral lines does not change. The purpose of this research is to develop a plot that shows the spectra patterns of the flute and a selection of different musical instruments to compare their acoustical characteristics.

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