Researchers at the University of South Florida have developed a novel method to vary the frequency vibration of a string.

The pitch of a stringed instrument is determined by the vibration frequency of a string. There are three ways to change the frequency of a string’s vibration: by changing the length, tension, or thickness of the string. Most stringed instruments, such as a guitar, produce different pitches through changing the length by fretting the string, which creates a shorter string and produces a higher frequency (note), or have individual strings at various lengths constantly designed to play one frequency. Such instruments have multiple strings of various thickness, and each different string can alone produce a different note. Currently, there are no stringed instruments that are capable of changing vibration frequency though varying the tension on a string.

USF inventors have developed a method to actively change the tension of a string to change its vibration frequency, or pitch. This is achieved in a purely mechanical fashion by utilizing a specialized kinetic shape. The kinetic shape is attached to the string and by altering the orientation of the kinetic shape, the string tension changes resulting in a change to the strings vibrating frequency. A computer-controlled prototype has been constructed to demonstrate the possibility of a musical performance using the device. The invention might also be applicable in force sensing through vibration analysis.

**ADVANTAGES:**
- Easily change the string vibration frequencies
- Mechanically generates exact string vibration frequency
- Can be applied in manufacturing strain gages

**Novel Musical Instrument Capable of Playing Different Pitches on One String**

**Schematic Diagram of the Stringed Musical Instrument**

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