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**A frequency shifting model of pitch**

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We present a model useful for tracking of melodies of sounds that can have arbitrary harmonic structure (including inharmonic instruments and noise sources). This model is based on a spectral shift assumption which is capable of tracking melodic movements of an instrument regardless of the irregularity of its spectrum. This technique can be used to simultaneously estimate the spectral character of the instrument to be analyzed in addition to its melody. It is capable of dealing with multiple instances of the same instrument, thereby recognizing chords as well as notes, and can also extract multiple melodies in audio signals composed out of many instruments.