

# Time-Varying Equalizers

Yangang Cao

February 20, 2019

There is a wide range of effects that are based on time-varying equalizers, some of which are briefly described in the following:

- Time-varying octave bandpass filters, as shown in Figure 2.25, offer the possibility of achieving wah-wah-like effects. The spectrogram of the output signal in Figure 2.26 demonstrates the octave spaced enhancement of this approach.
- Time-varying shelving and peak filters: the special allpass realization of shelving and peak filters has shown that a combination of lowpass, bandpass and allpass filters gives access to several frequency bands inside such a filter structure. Integrating level measurement or envelope followers (see Chapter 4) into these frequency bands can be used for adaptively changing the filter parameters gain, cut-off/center frequency and bandwidth or Q factor. The combination of dynamics processing, which will be discussed in Chapter 4, and parametric filter structures allows the creation of signal dependent filtering effects with a variety of applications.
- Feedback cancellers, which are based on time-varying notch filters, play an important role in sound reinforcement systems. The spectrum is continuously monitored for spectral peaks and a very narrow-band notch filter is applied to the signal path.