hierarchical spike coding of sound
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spectrogram

spikegram
(Lewicki & Sejnowski 1999, Smith & Lewicki 2005)

- analytic method
- time/freq trade-off
- dense

- generative model
- precise in time & freq
- sparse
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the hierarchical spike coding (HSC) model

- second layer spikes
- "rate kernels"
- "rate map" (log-probability)
- exponential, Poisson spiking
- first layer spikes (spikegram)
HSC learns high-level acoustic features

rate kernels trained on speech include:
• harmonic stacks
• sharp onsets
• frequency sweeps
• high frequency bursts
denoising:
• outperforms wiener, wavelet-threshold
• especially on non-stationary noise