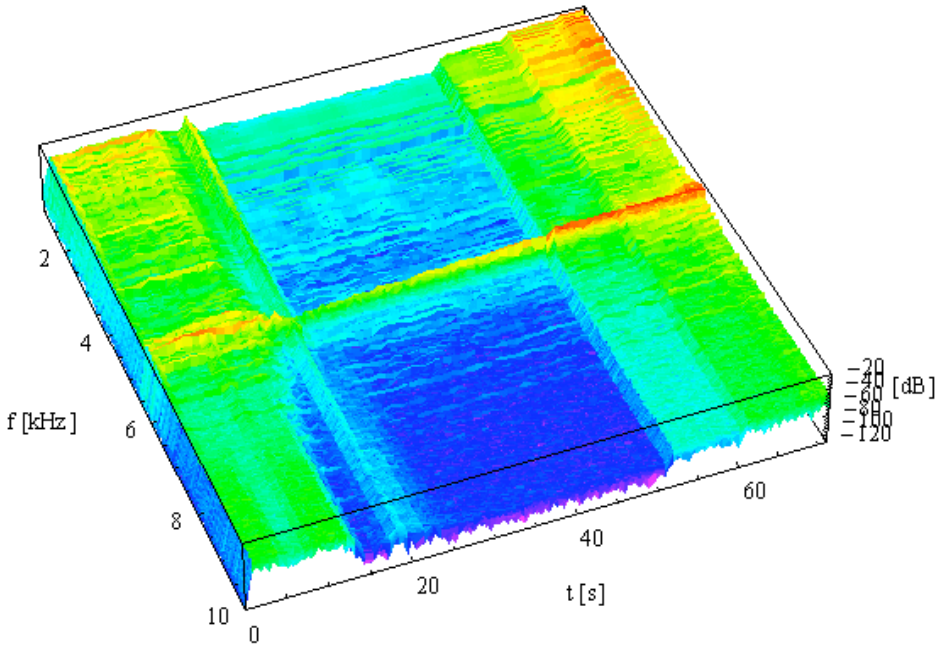
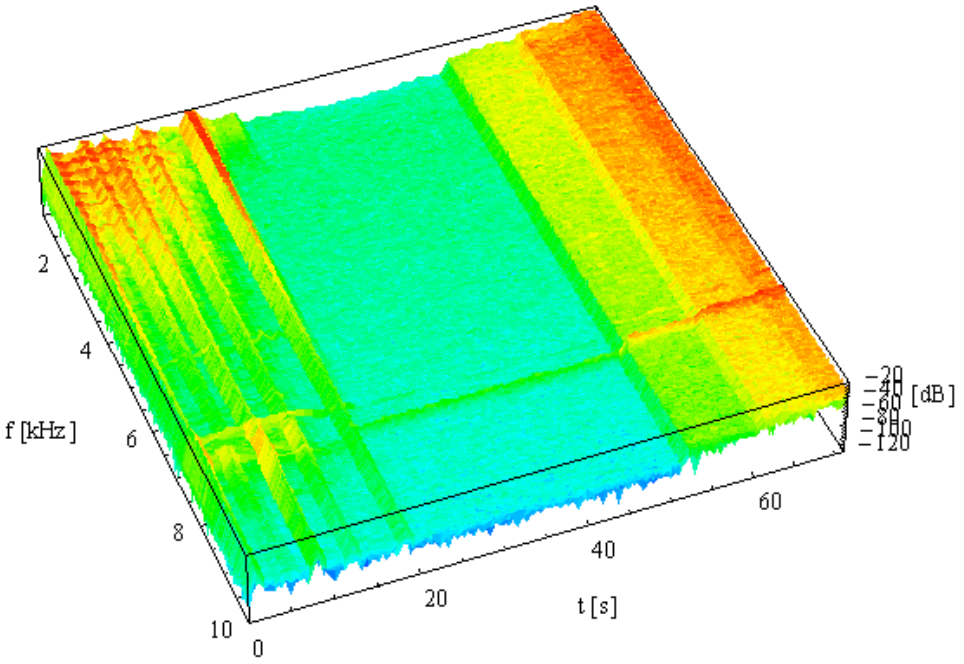
Collimator MDs #1

Some results from the Base-Band Q (BBQ) Measurement

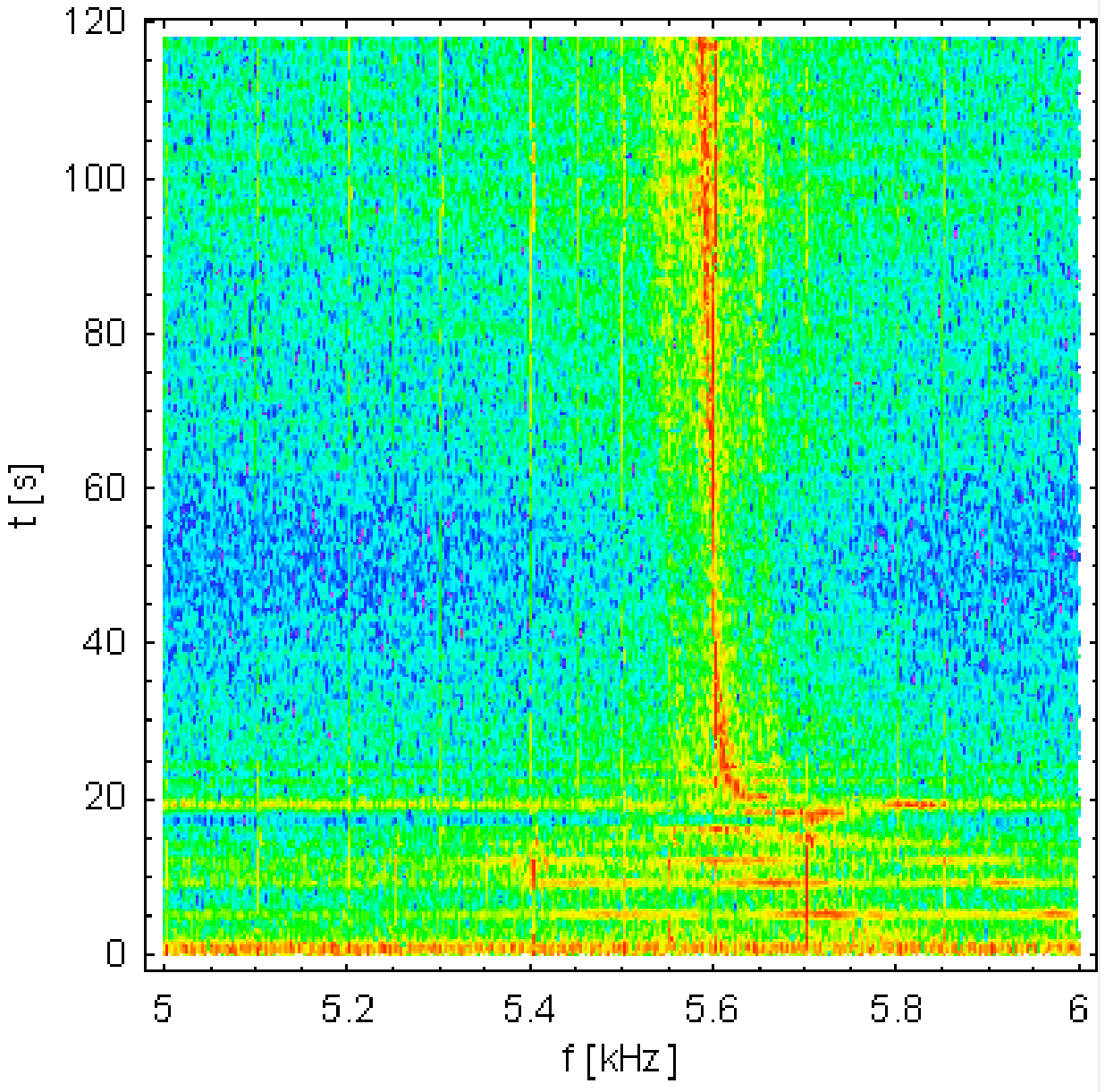
M. Gasior, R. Jones, CERN-AB-BDI

Collimator MDs #1 – (some) BBQ results

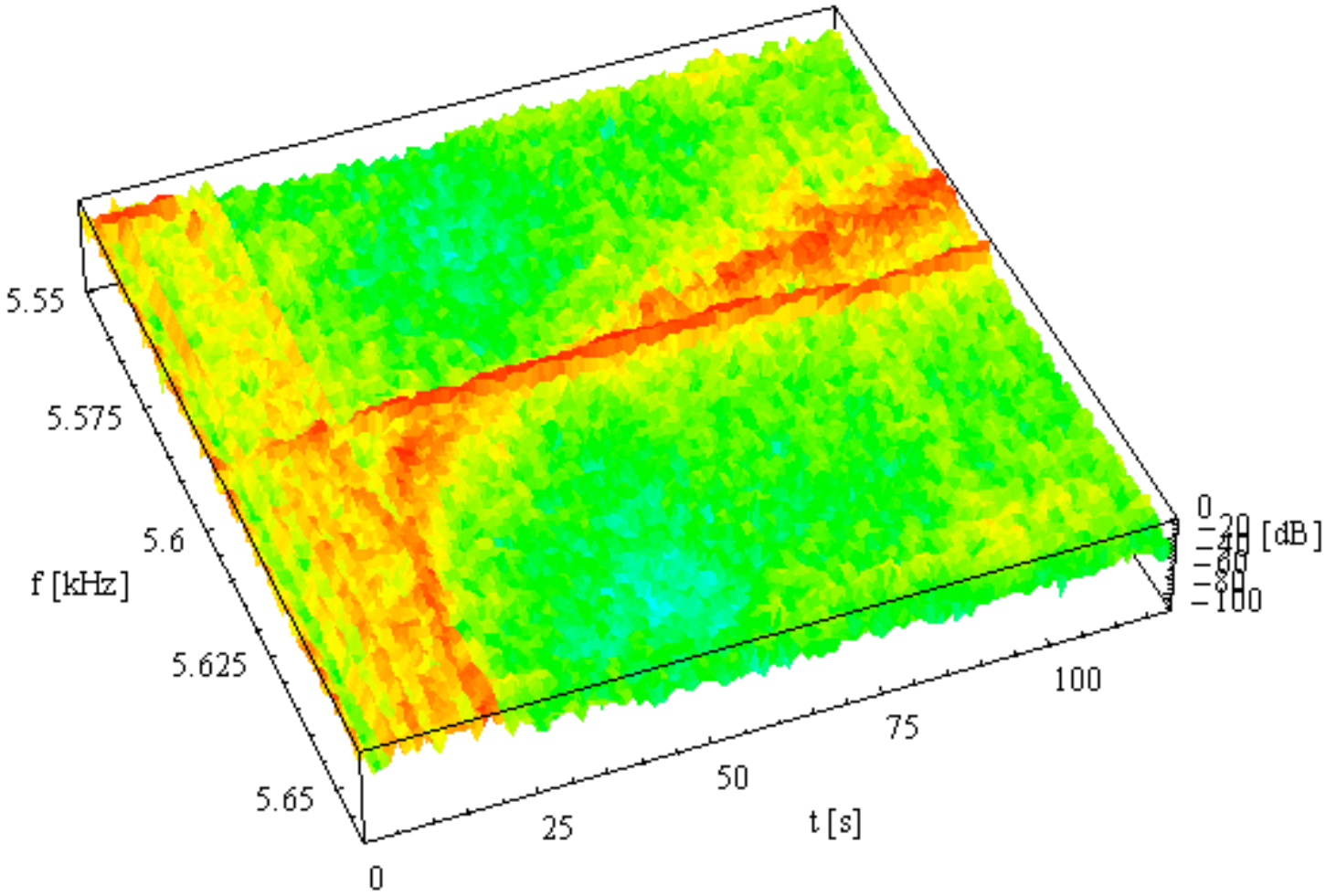




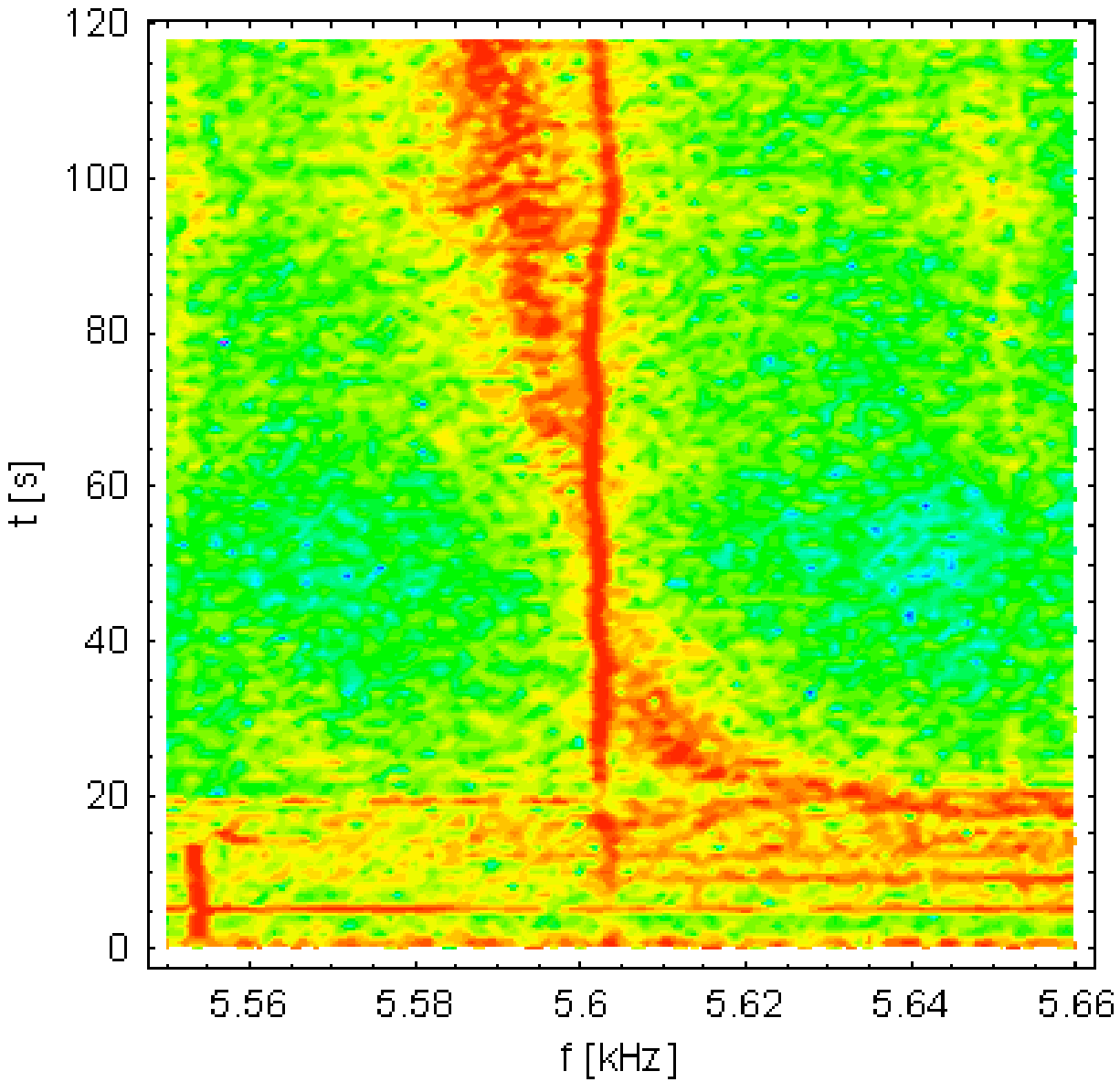
Collimator MDs #1 – (some) BBQ results



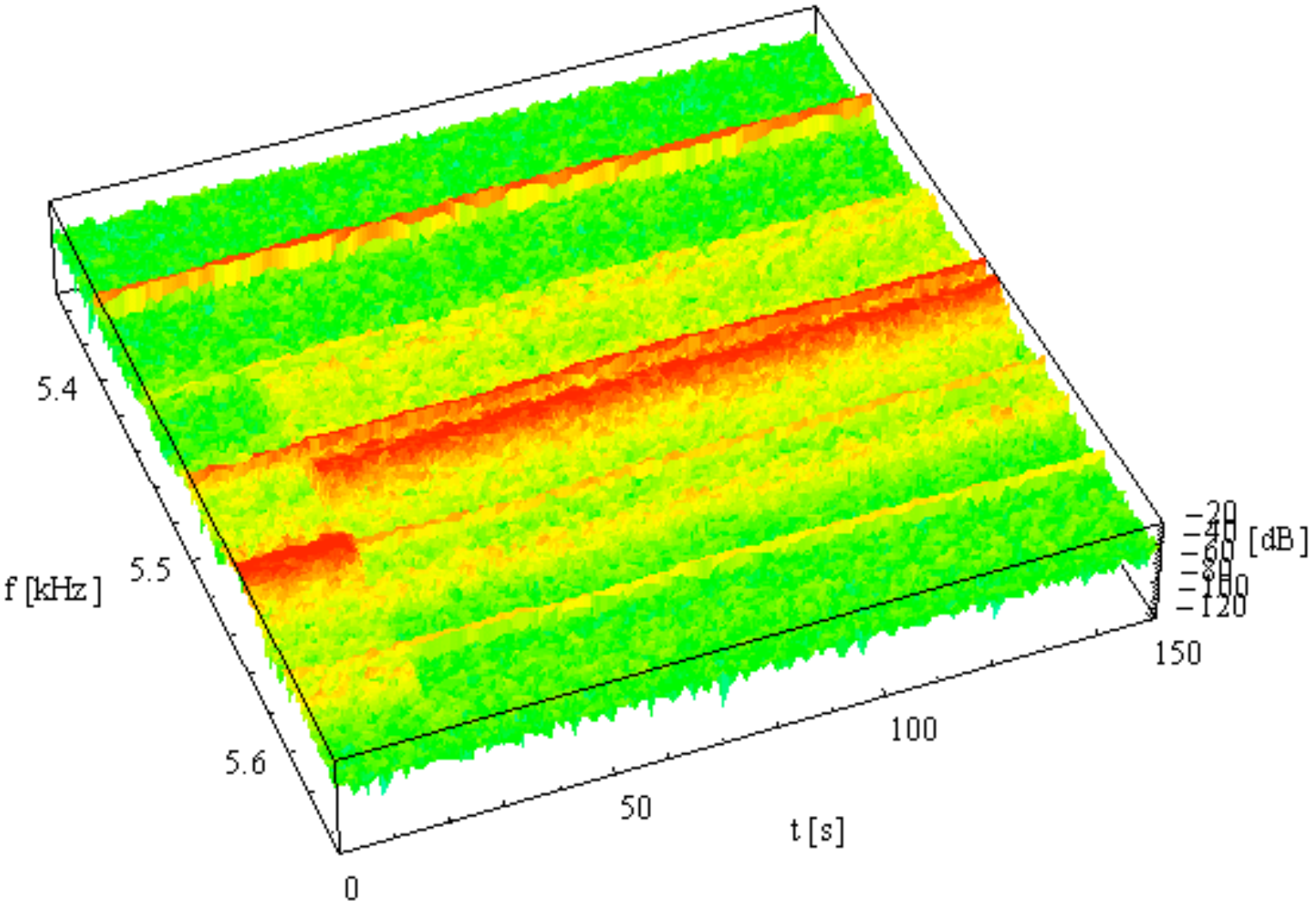
Collimator MDs #1 – (some) BBQ results



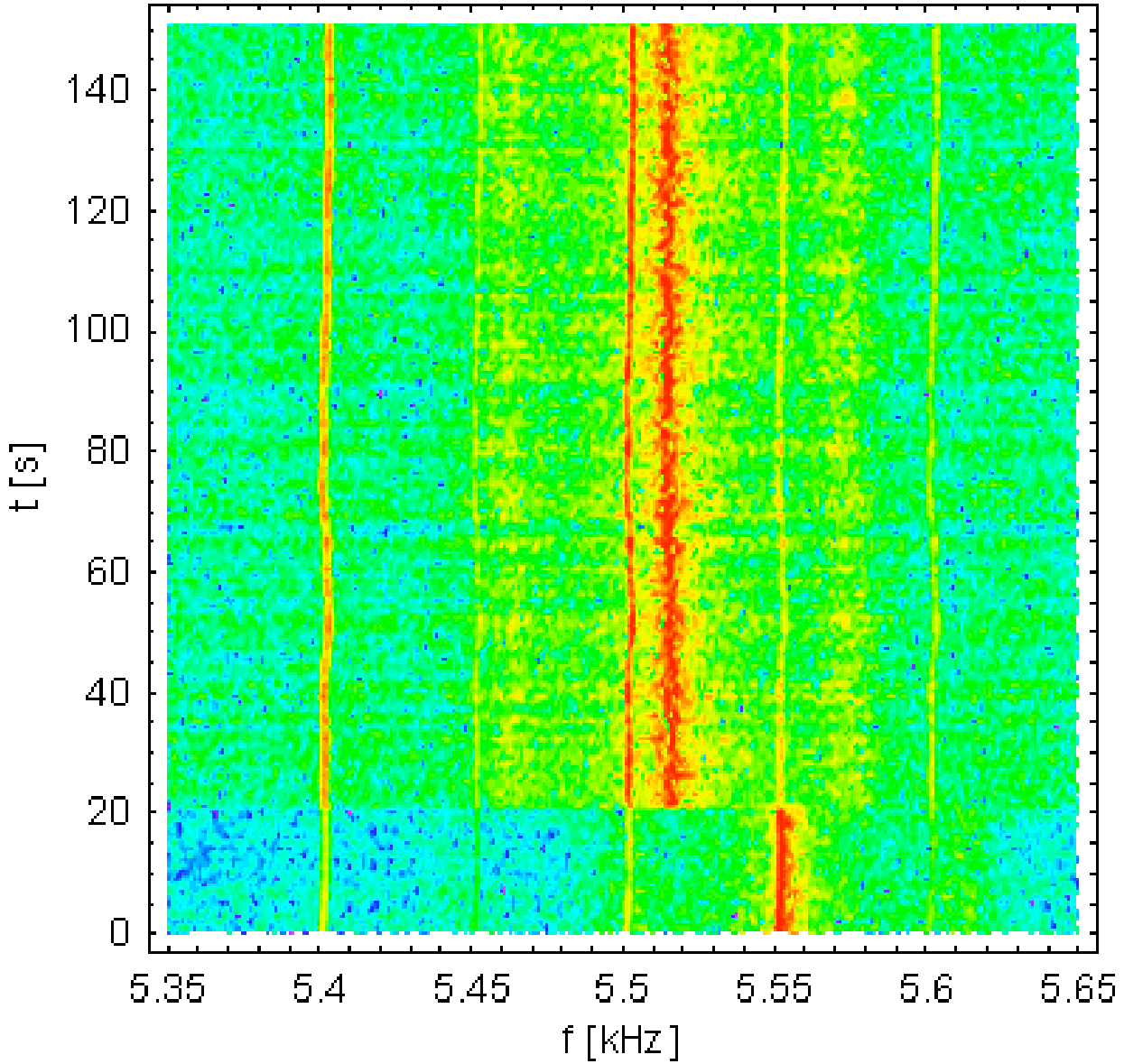
Collimator MDs #1 – (some) BBQ results



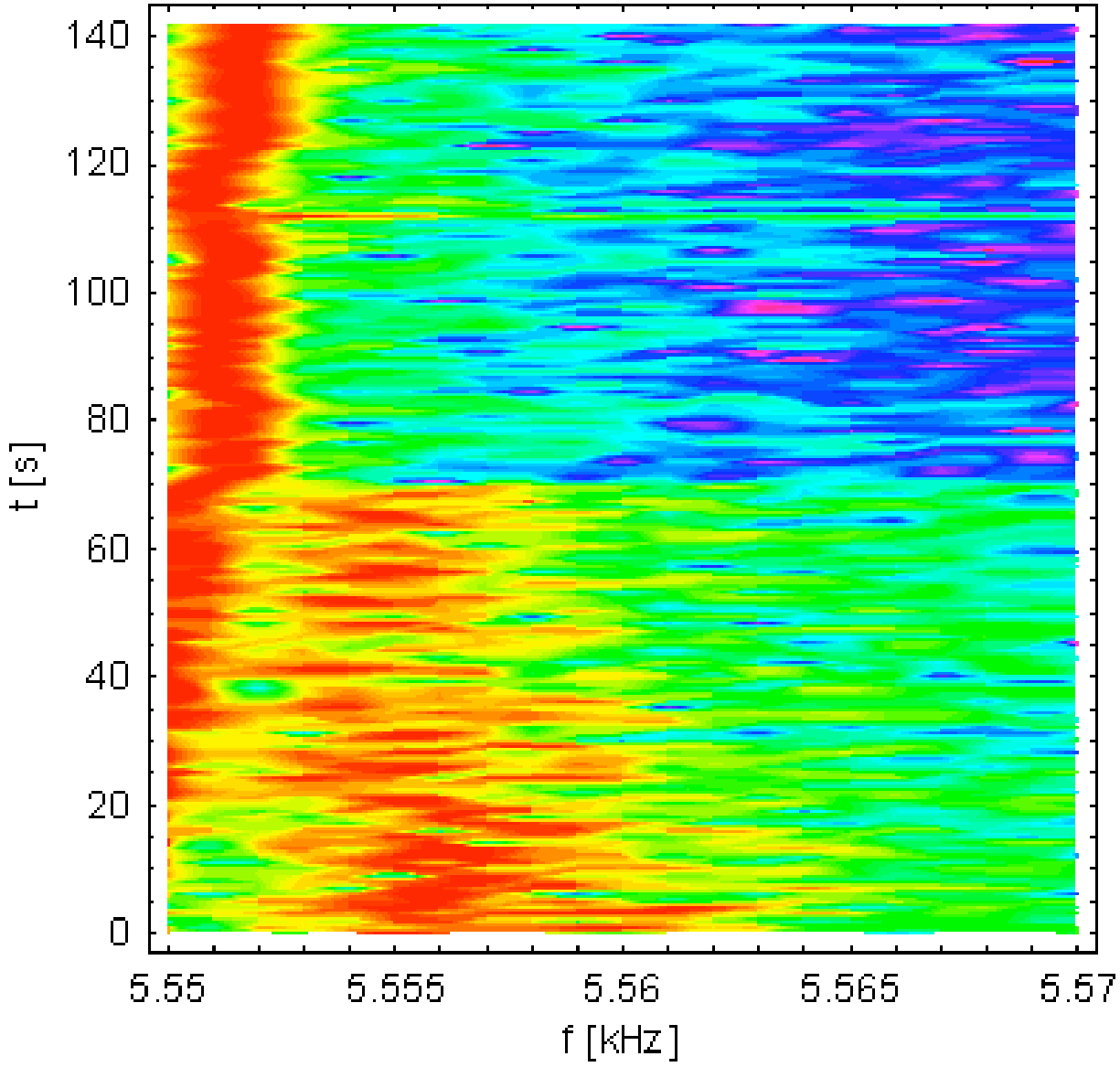
Collimator MDs #1 – (some) BBQ results



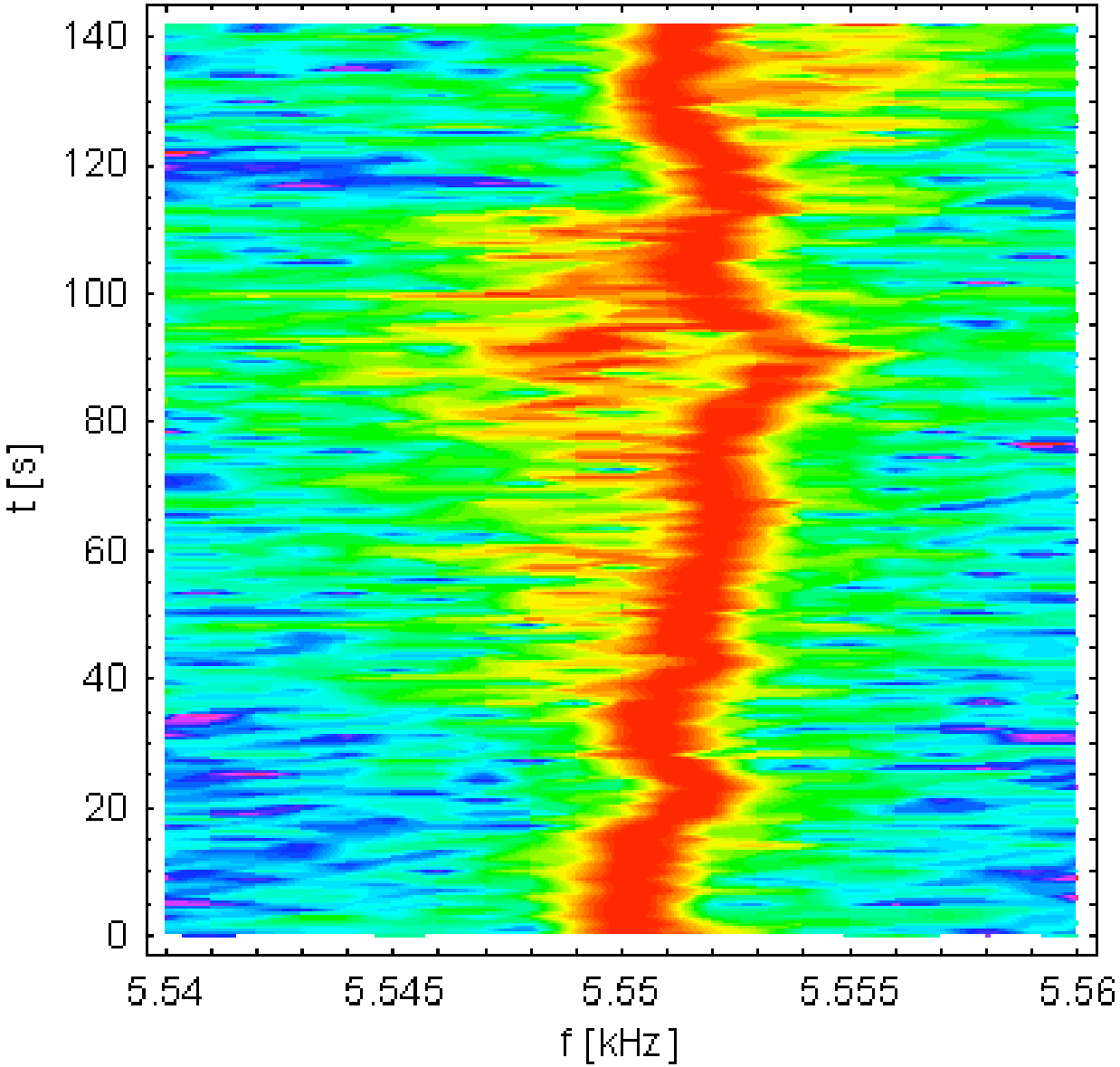
Collimator MDs #1 – (some) BBQ results



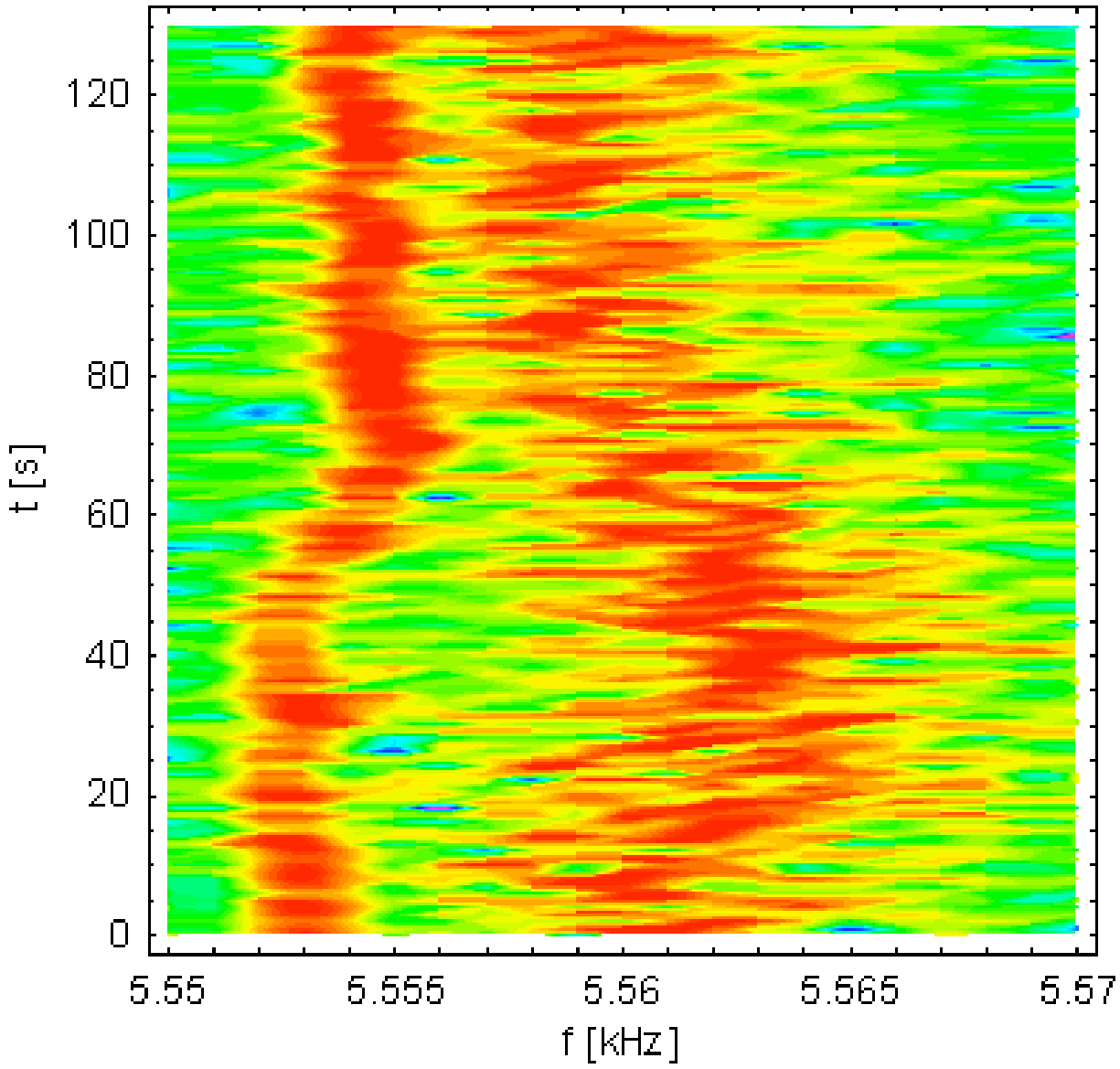
Collimator MDs #1 – (some) BBQ results



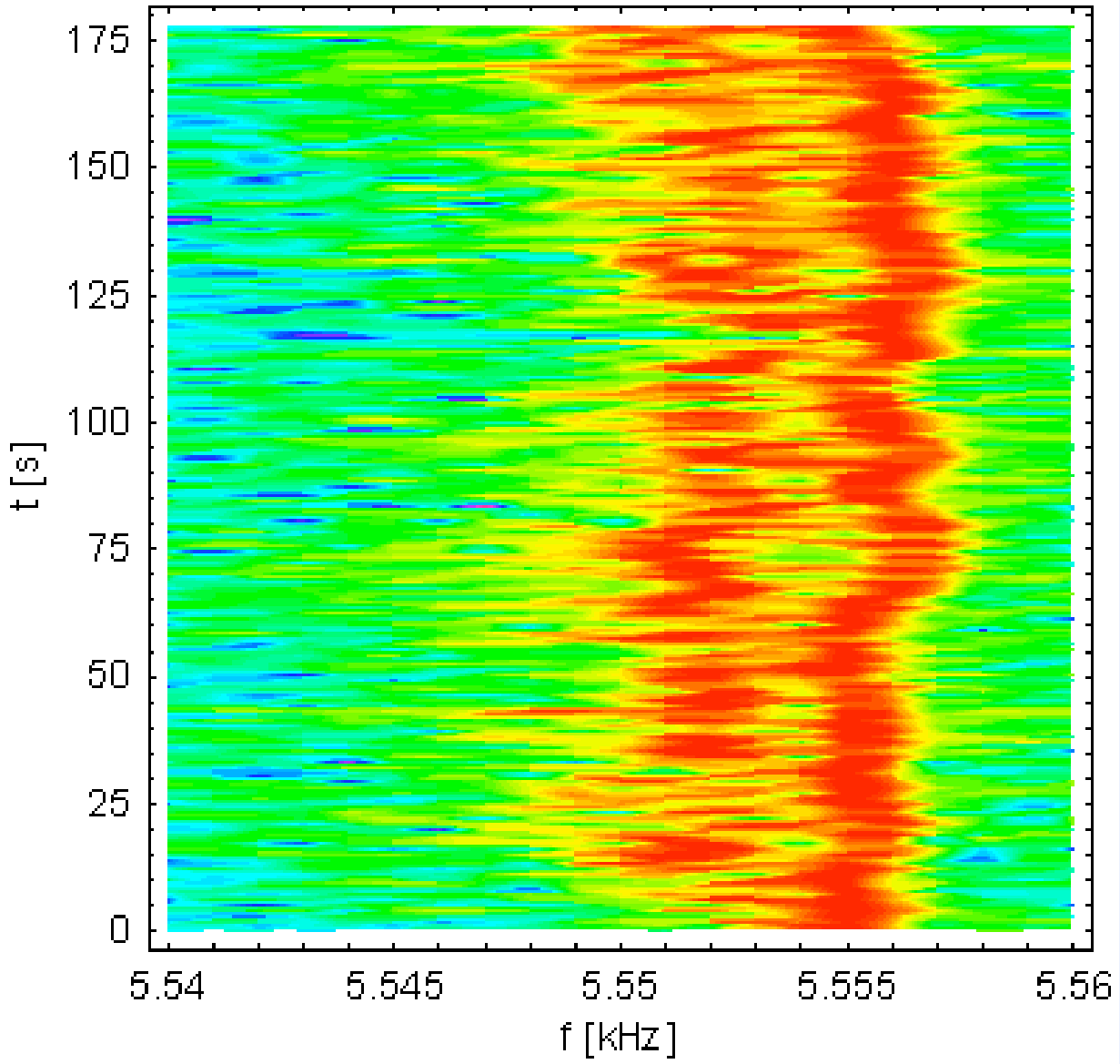
Collimator MDs #1 – (some) BBQ results



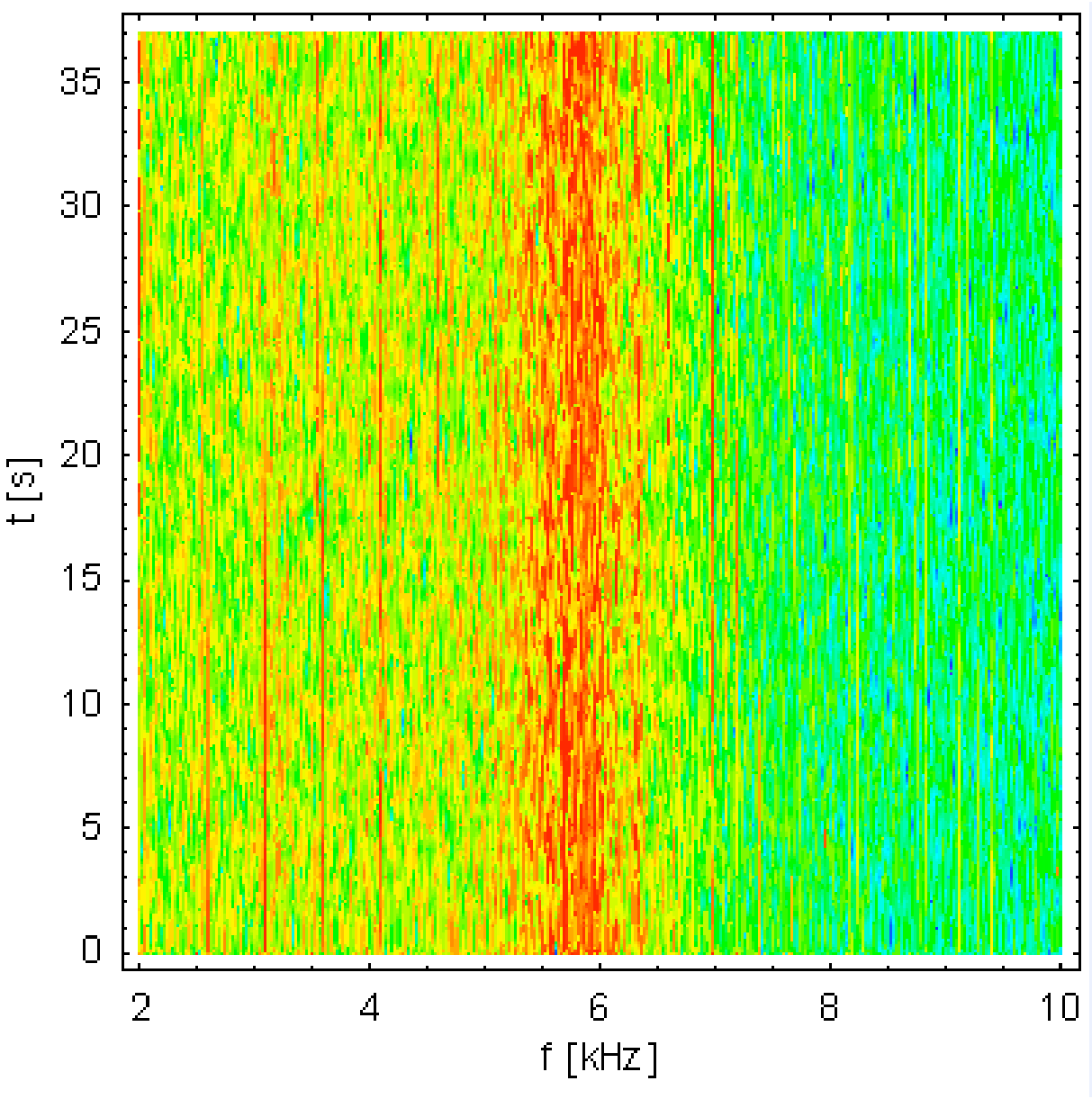
Collimator MDs #1 – (some) BBQ results



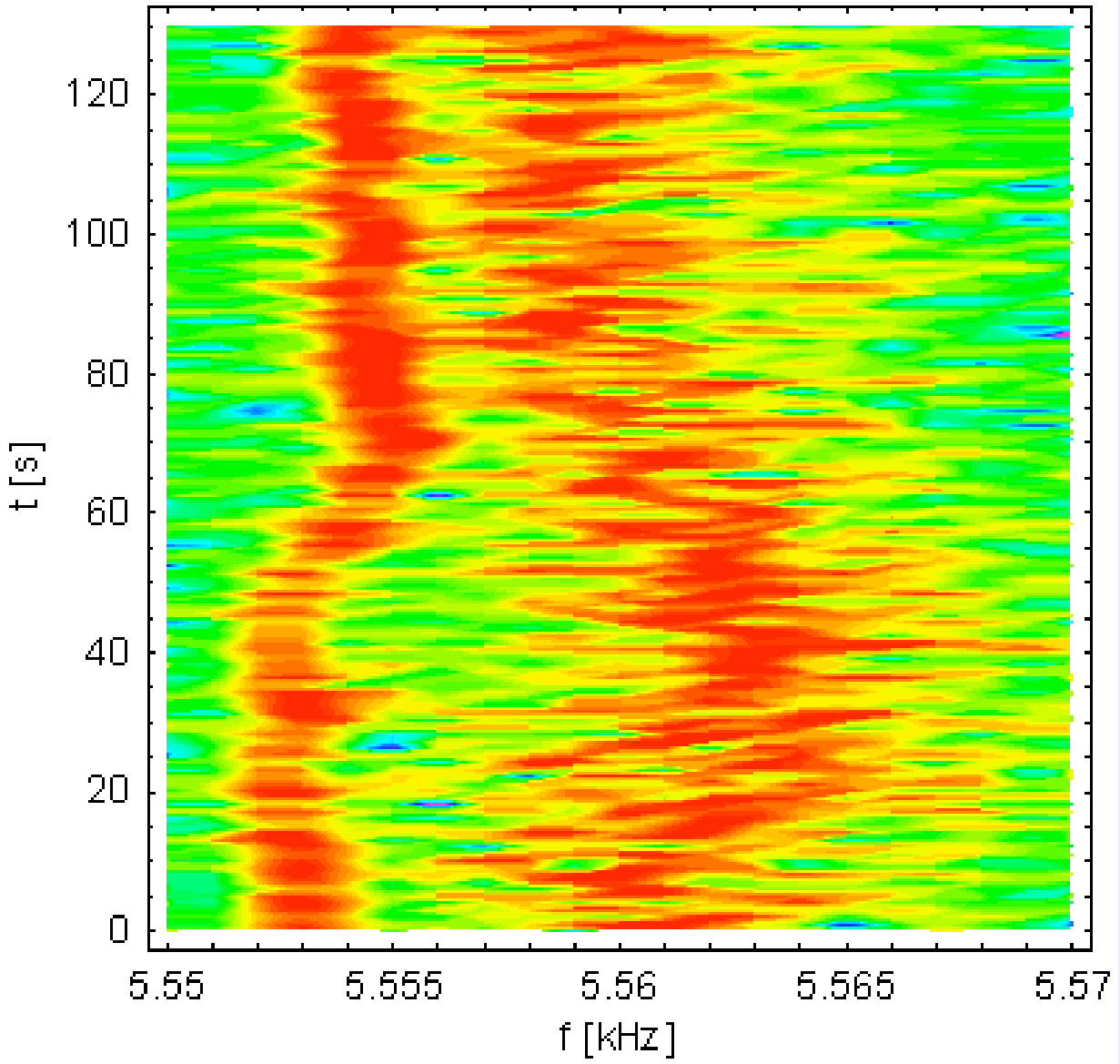
Collimator MDs #1 – (some) BBQ results



Collimator MDs #1 – (some) BBQ results

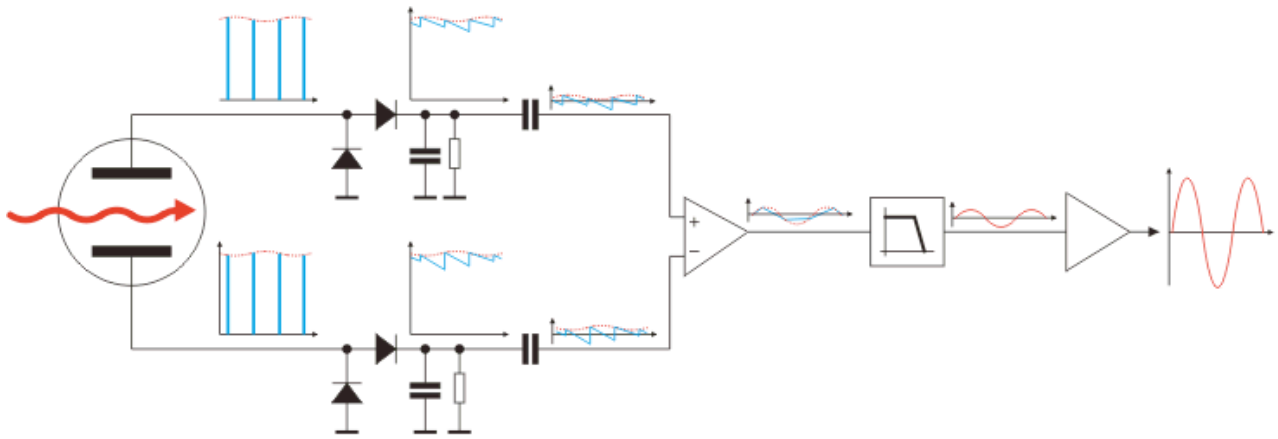


Collimator MDs #1 – (some) BBQ results



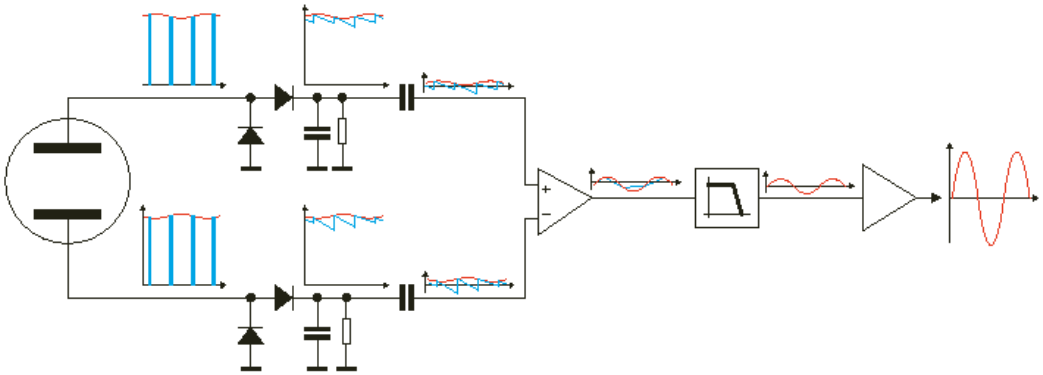
Spare slide: What is the 3D-BBQ ?

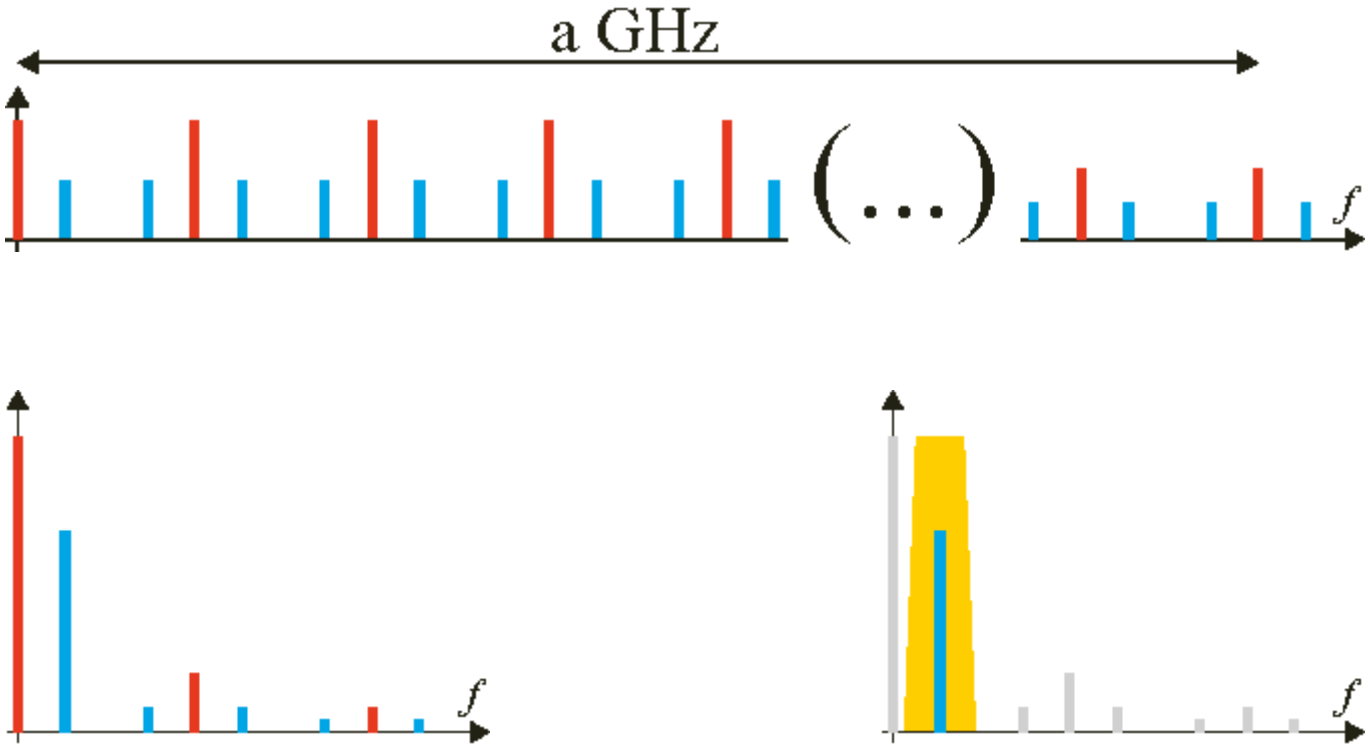
- A recent development, started beginning of this year
- Far from being finished
- Goal: as sensitive method as possible to see betatron oscillations in LHC to limit the emittance blow-up



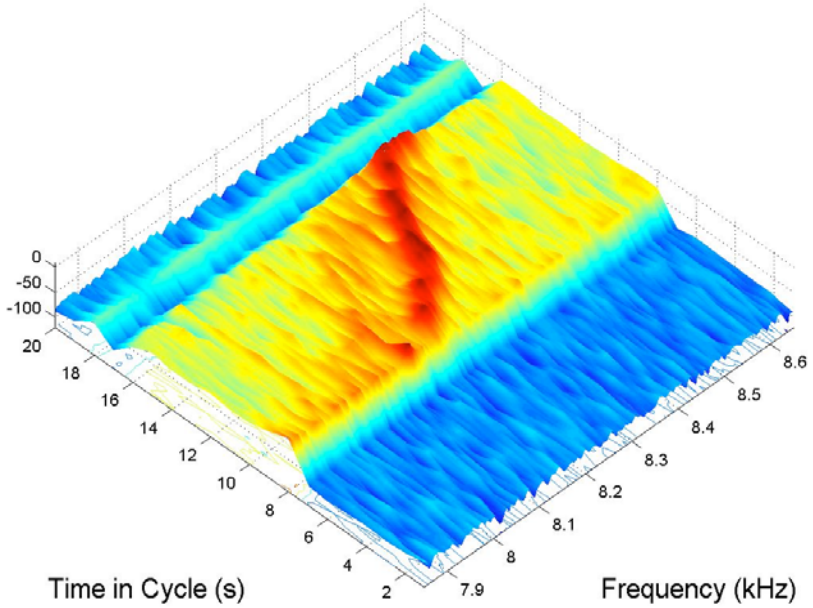
- The diode detectors, installed directly on PU electrodes, convert beam signal spikes into a saw waveform, with teeth having betatron frequency modulation, biased by a DC voltage related to spike amplitudes (revolution frequency energy)
- The storage RC network is connected to the amplifiers by a capacitor to cut out the DC voltage.
- The detectors from opposite PU electrodes are connected to a differential input amplifier, to subtract detector voltages and remove an offset related to the beam average position.
- The filter attenuates the revolution frequency and its harmonics, as well as very low frequencies. The revolution frequency is attenuated some 100dB in respect to the betatron band.

Spare slide: How it works: the frequency domain



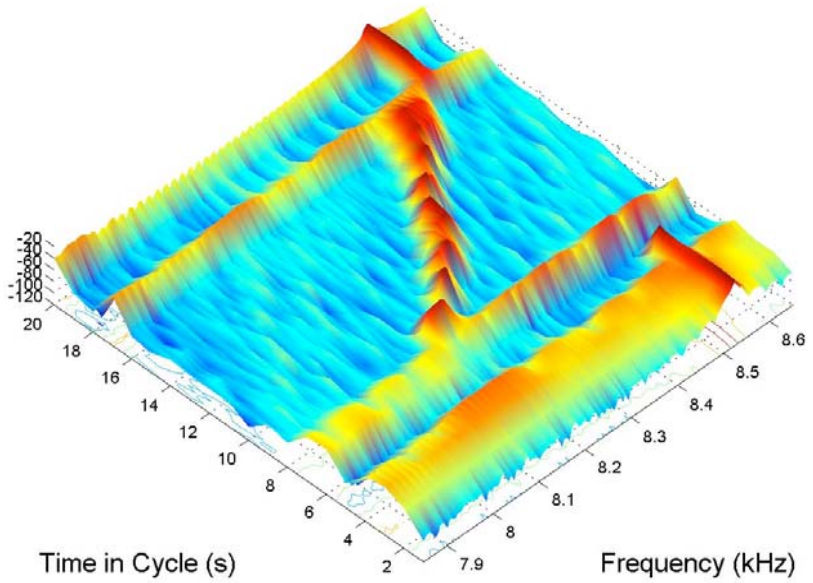


Spare slide: LHC beam, Damper off, PLL locked



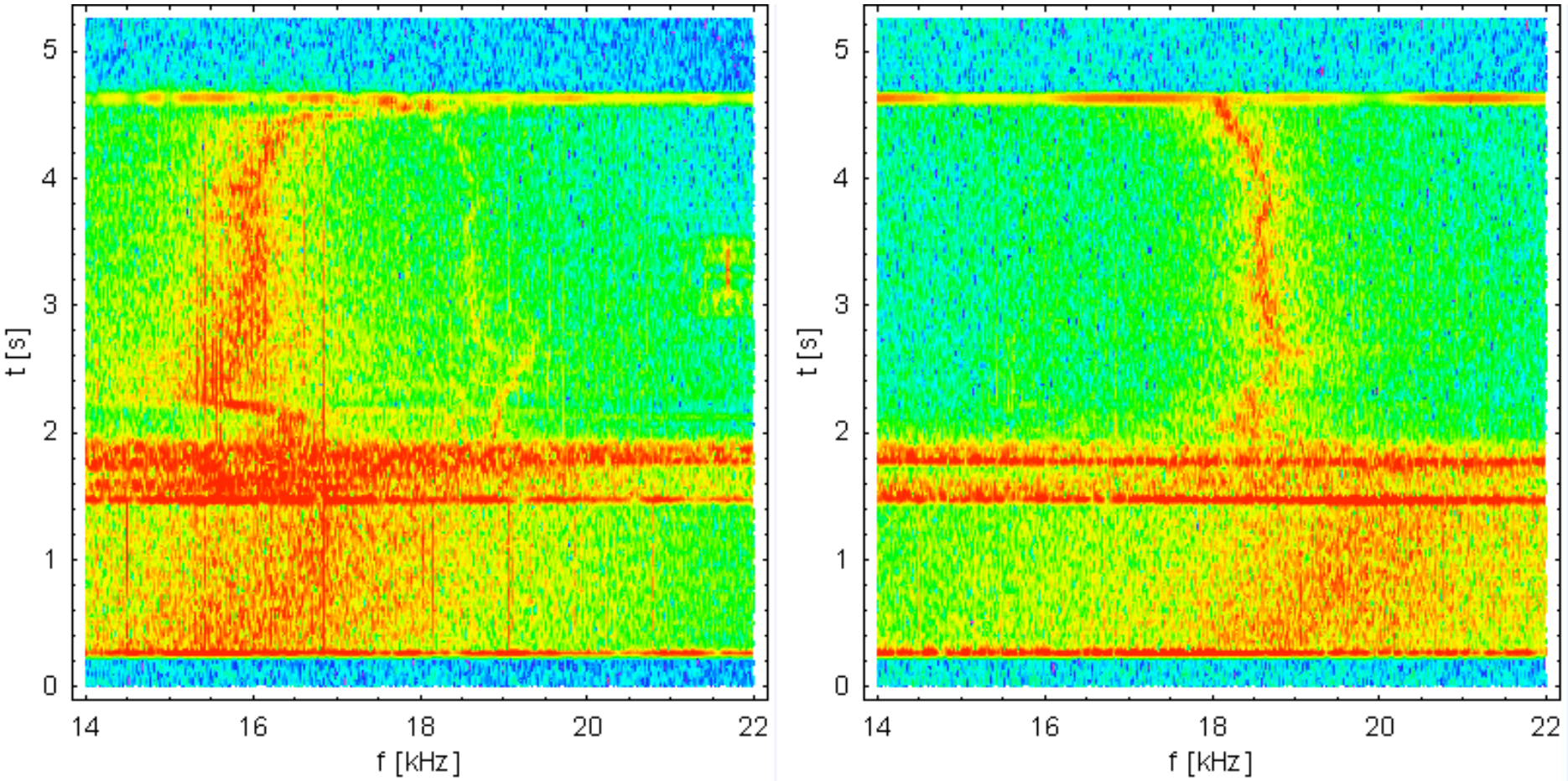
LHC beam: 72 bunches,
~5×10^{10} ppb, 26GeV,
Damper OFF

The beam signal from the 3D-BBQ



The excitation signal sent to the kicker pick-up

Spare slide: Fixed targed results



http://www.cern.ch/gasior/pro/3D-BBQ/3D-BBQ.html