

Optimum Filtering for Aug 1-3 T10 data

Sebastian White, Aug. 16, 2015

This is an exercise to evaluate various alternative filters for the T10 data taken a couple weeks ago.

It also gives you an idea of the relative performance of Mitch's vs. the Cividec amplifiers and illustrates the faster time response with the 2x2 sensors (nominally 4 pF vs 24 pF C_{DET}).

All channels are BW limited to 1 GHz.

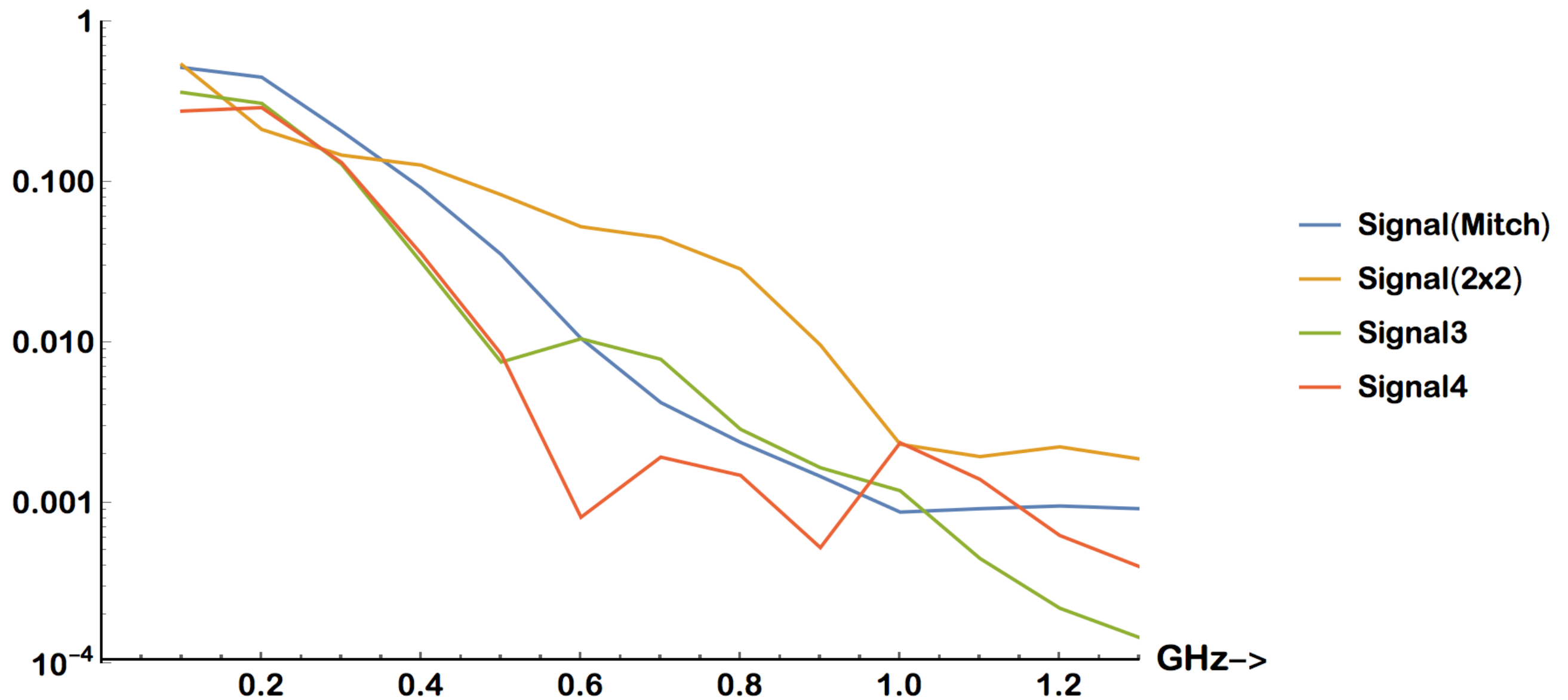
The internal scope filter ("2bit noise filtering") gives a pretty nice signal cleanup- particularly on the ~1 GHz noise appearing on cha 2&4. But it has the disadvantage that the data are stored with it applied so you can't change it. The

Wiener filter does about as well.

It seems worth trying other filters- for example a bandpass below ~600 MHz.

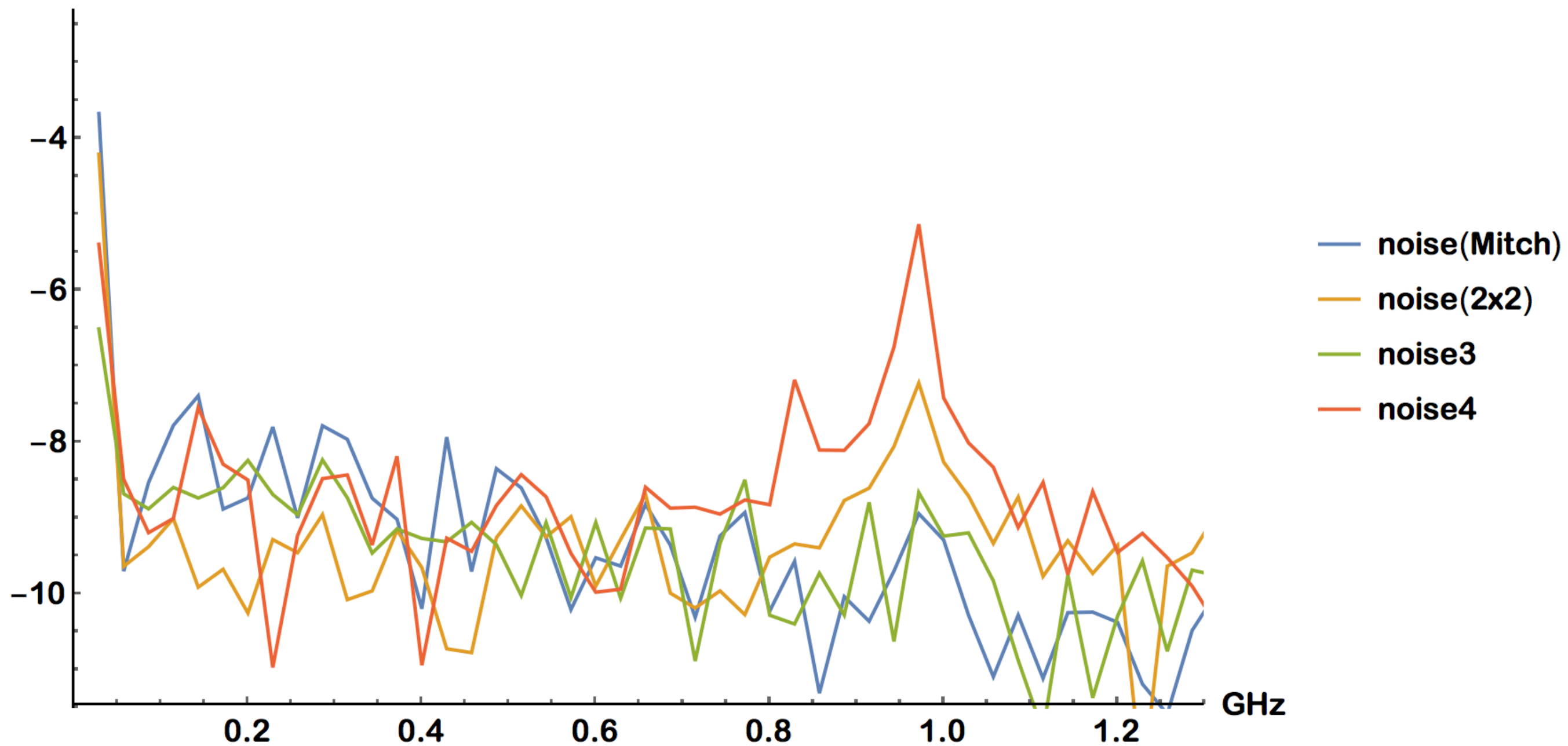
PS-T10 run 8-02-006, no filtering

Signal in Frequency Domain



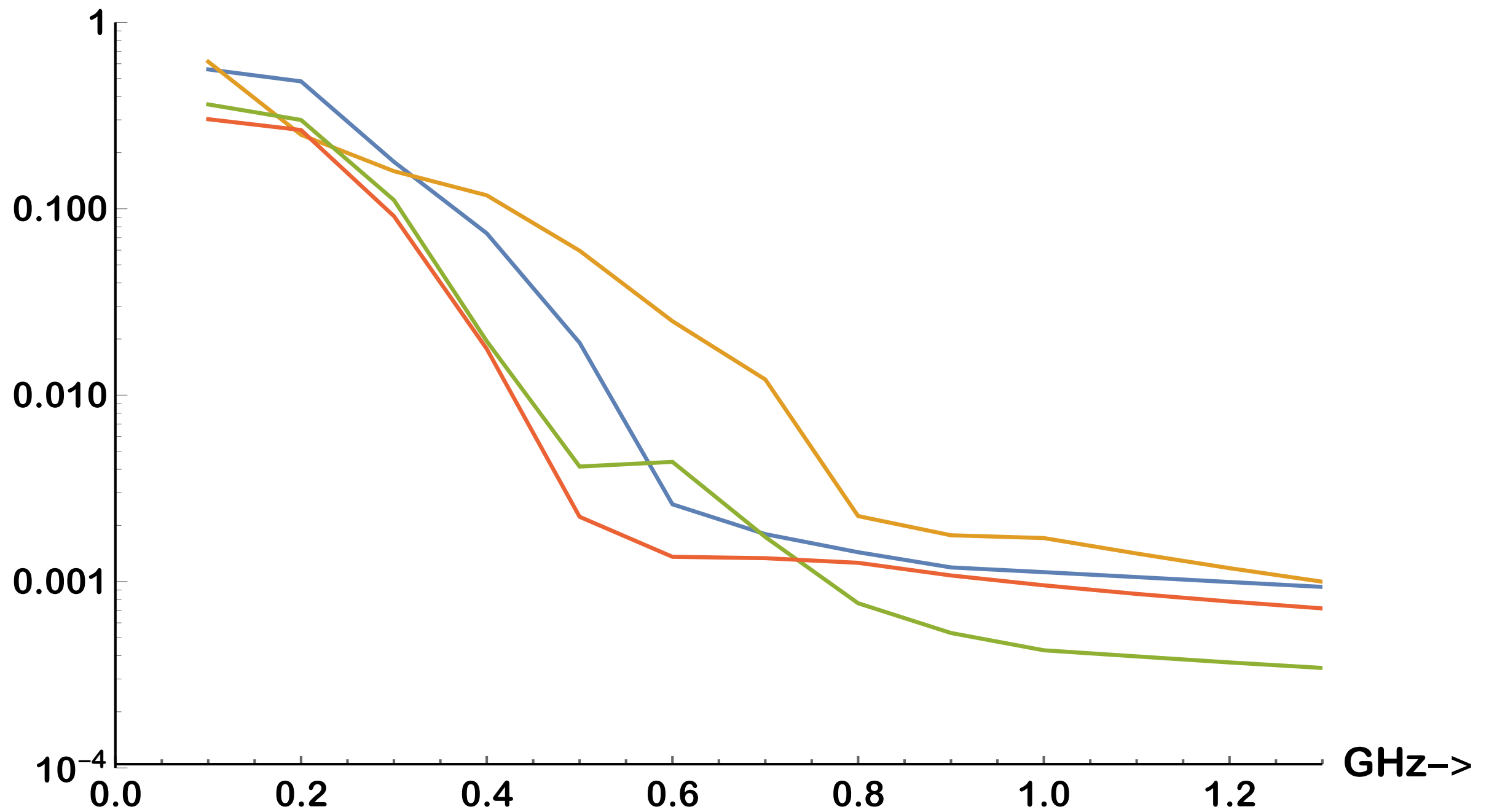
PS-T10 run 8-02-006, no filtering

Noise in Frequency Domain



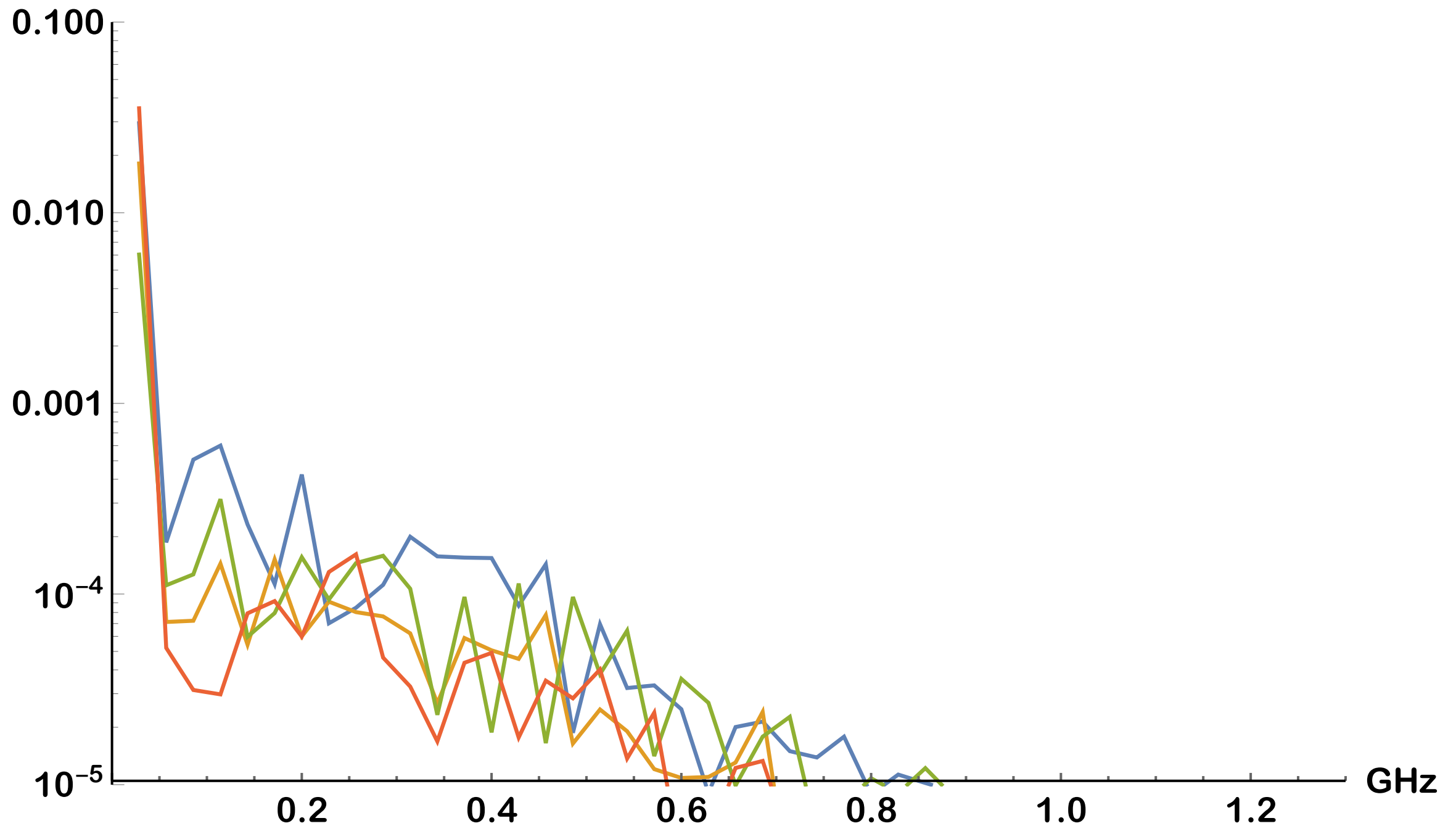
PS-T10 run 8-02-004, effect of 2 bit noise filtering

Signal in Frequency Domain



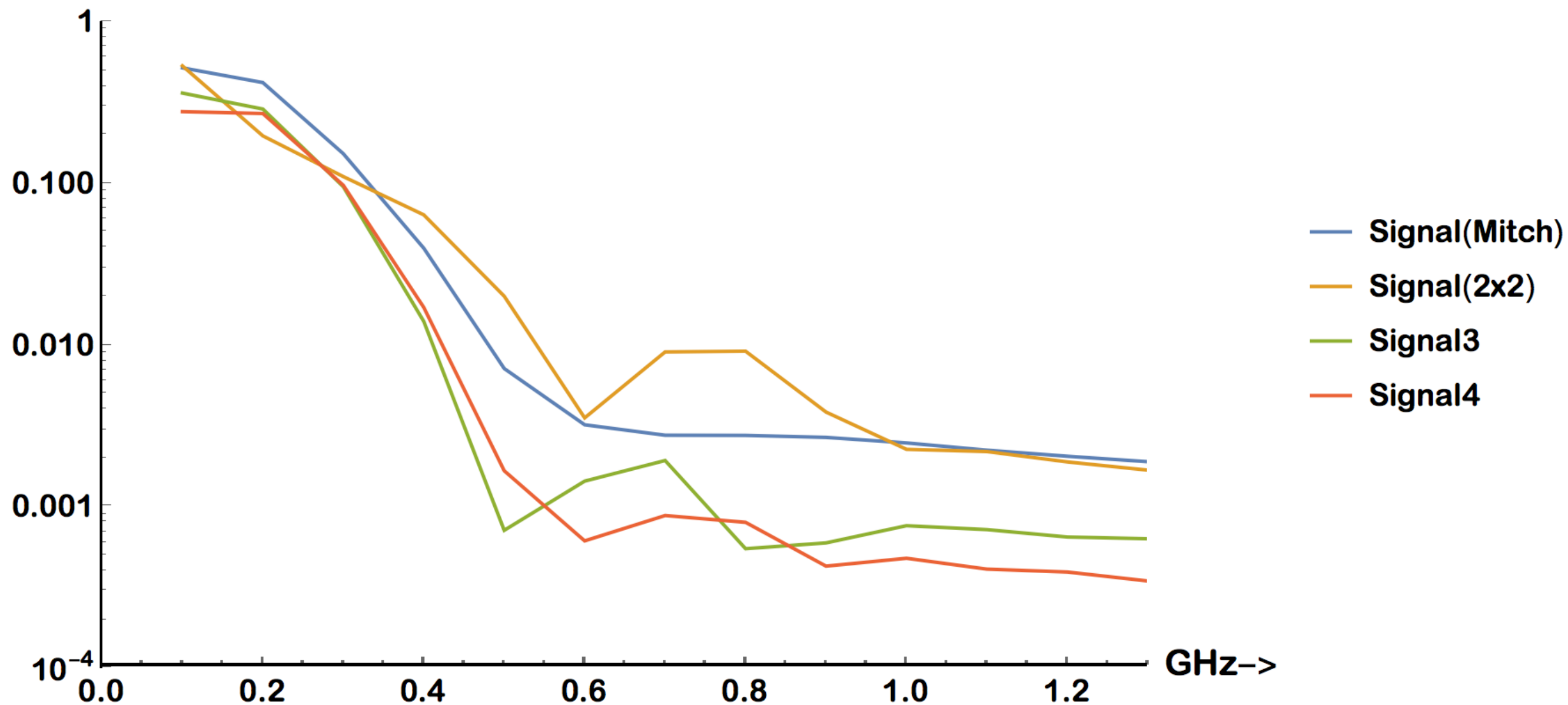
PS-T10 run 8-02-004, effect of 2 bit noise filtering

Noise in Frequency Domain



PS-T10 run 8-02-006, range 10 Wiener Filter

Signal in Frequency Domain



PS-T10 run 8-02-006, range 10 Wiener Filter

Noise in Frequency Domain

