

Weekly Report ('04 Winter) # 2

「Whitenoise of Demodulator2」

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1 Noise search of improving demodulator

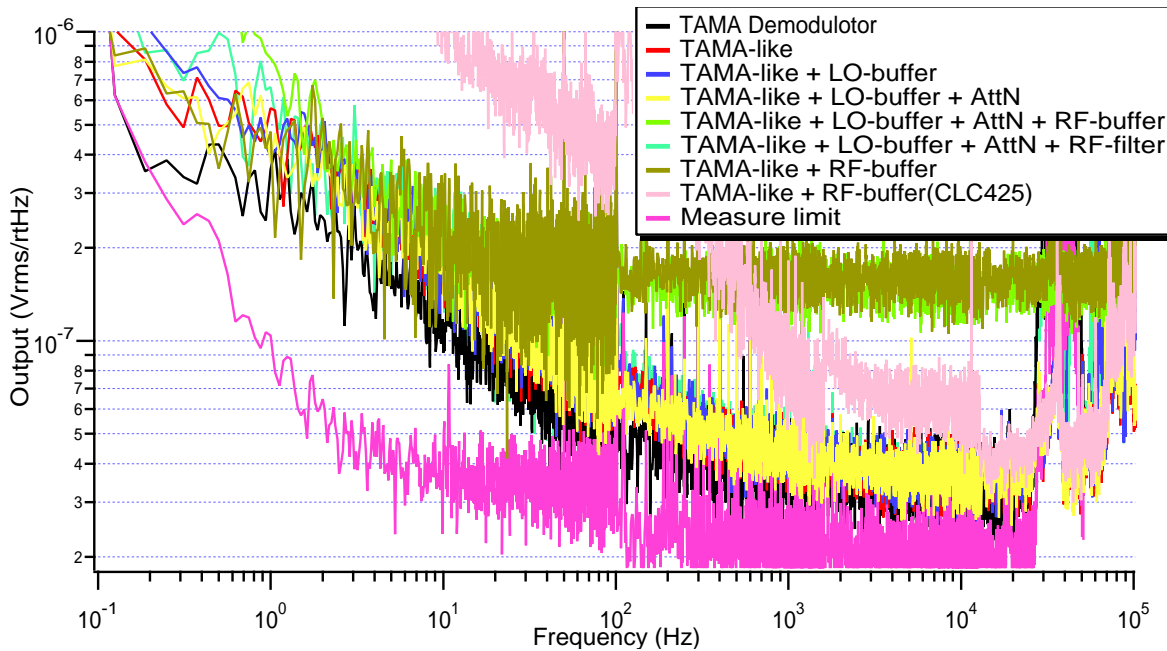


Figure 1: Each step noise of improving. This graph means noise spectral of demodulators. LO input is 15.235MHz sin wave, 2.55V. RF input is ended 50Ω. I watch Output of demodulator. I compare each step. BLACK line is TAMA demodulator. RED line is TAMA-like demodulator (I connect improved new demodulator like TAMA with wires). And then, I add buffer and filter piece by piece to approach the improved demodulator. I use AD811 as buffer except "TAMA-like + RF-buffer(CLC425)".

From figure1, addition of LO-buffer, attenuator, and RF-filter hardly change spectral. But when I add RF-buffer, spectral changed clearly worth. I find source of noise is buffer, and I need think about this.

On the other hand, noise level of AD811 was about -160dBVrms/rtHz. This contains 12.3×10^{-9} Vrms/rtHz noise at output port. This noise level is almost same as spec sheet of AD811. From this, noise level doesn't worth by only AD811.

I also change buffer to CLC425. This noise level is about -155dBVrms/rtHz. This contains 22.0×10^{-9} Vrms/rtHz noise at output port. Trying compare with AD811 will be failed because CLC425 was something wet and too hot after measurement. The cause is I supply over voltage to CLC425. (I input 15V ,but max of this is 14V) The result is on figure1.

It is quite difficult to identify noise source of demodulator. I try any thing about this.

2 Next Week

- I change buffer AD811 to AD8099.
- I separate ground plate.