IF Baseline Experiments
Project TBASERDN030519, May 19, 2003

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Introduction

Over the past few weeks, baseline ripples with periods of about 60 MHz have been isolated to the Converter Racks, and it was also determined that the ripples went away if three of four Optical Receiver output ports are terminated, rather than connected to the Converter Modules. On May 19, baseline experiments were done to see if passive thermal stabilization of the 4-way power divider within the Optical Receiver mitigated the 60 MHz ripple.

The Spectrometer was used in an four-bank, eight sampler, 800MHz mode, with 10 second records, and 60 second scan times. Optical fiber channels 1 and 3 were used, with CM1-8, and SF1-8.

Scans 11-23

Figures 1-8 show the data from all eight paths through Converter Rack A for scans 12-23, taking scan 11 as the reference. The 60 MHz ripple can be seen in most channels, and is particularly obvious in the OR1/CM3/SF3 path. Figure 9 plots the air temperature in Converter Rack A during these scans.

Scans 24-35

Prior to scan 24, all but one output (that to CM3) of OR1 were terminated. Figures 10-14 show the data from these scans. Note the CM3 path no longer shows the 60MHz ripple. Figure 15 shows the air temperature in Converter Rack A during these scans.

Summary

It is difficult to quantify closely, but it appears that the thermal stabilization of OR1 did little if anything to mitigate the 60MHz baseline ripple.

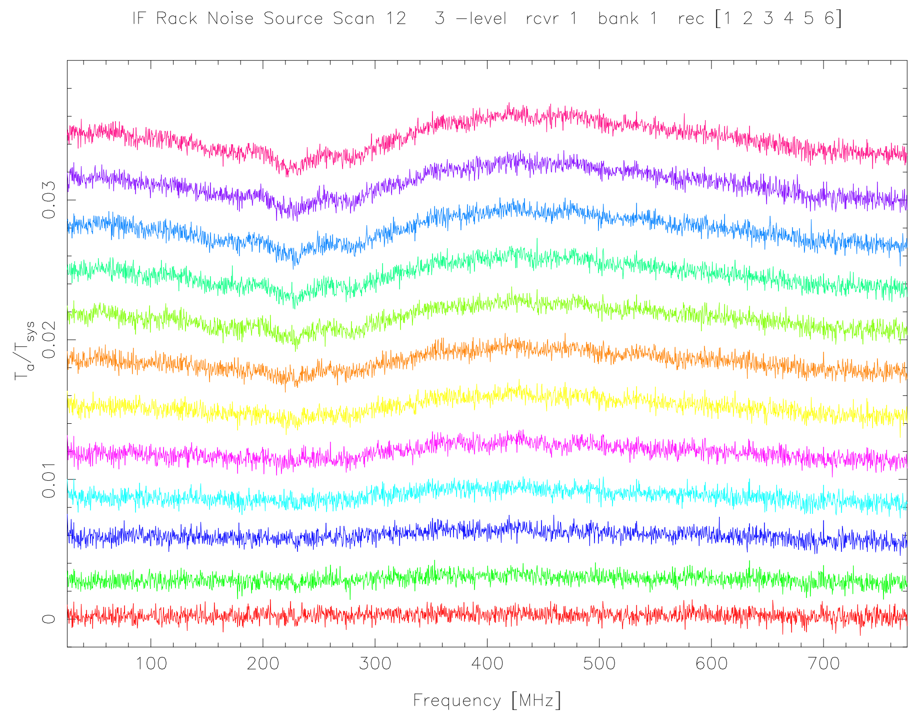

Figure 1: $(sig - ref)/ref$ for Scans 12-23, with Scan 11 as the reference, for the OR1/CM1/SF1 IF path.

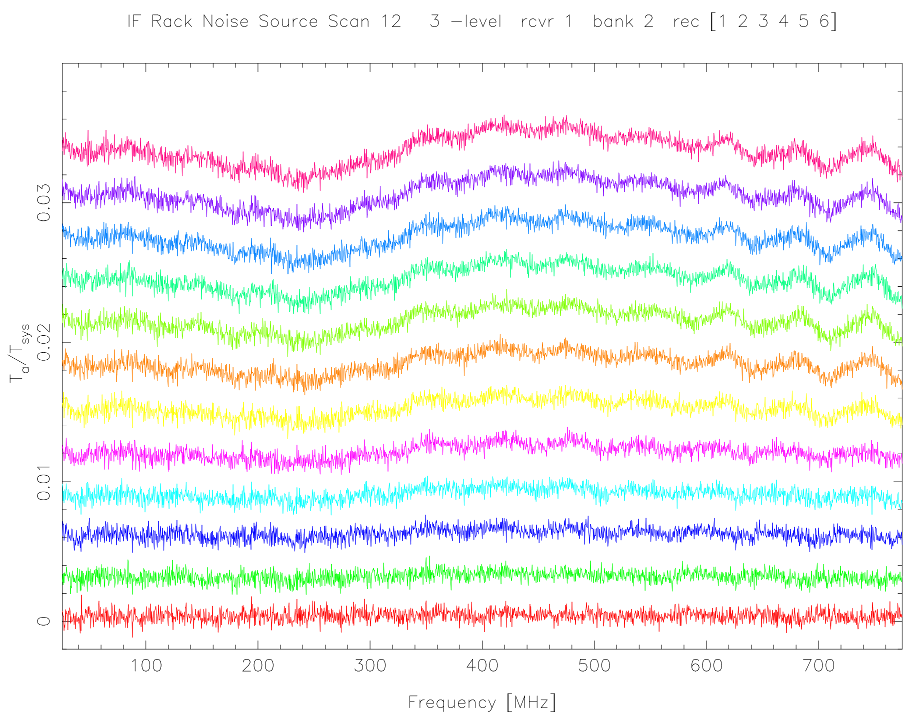

Figure 2: $(sig - ref)/ref$ for Scans 12-23, with Scan 11 as the reference, for the OR1/CM2/SF2 IF path.

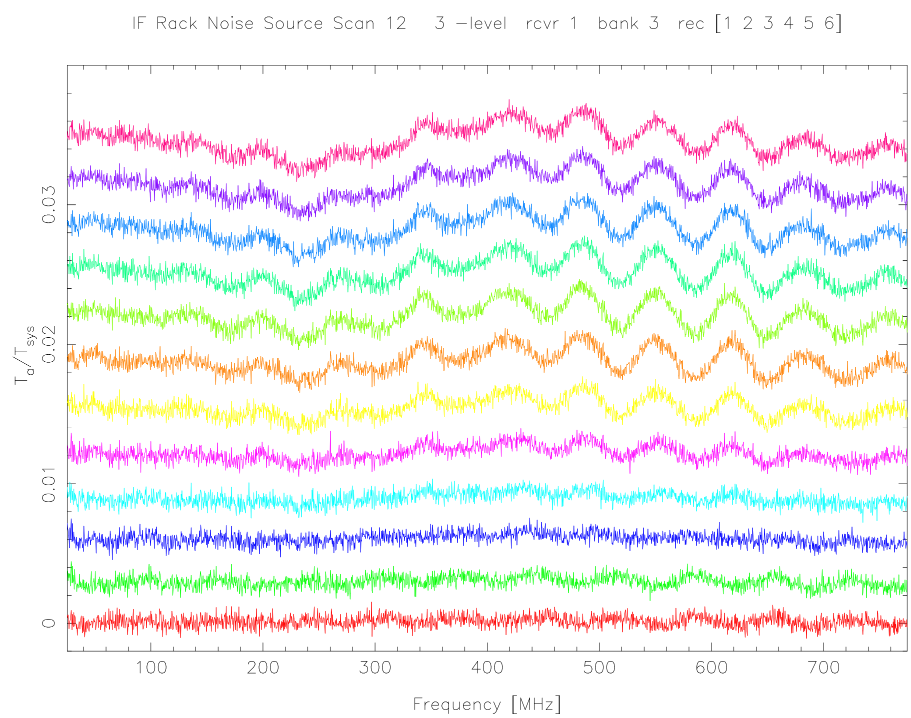

Figure 3: $(sig - ref)/ref$ for Scans 12-23, with Scan 11 as the reference, for the OR1/CM3/SF3 IF path.

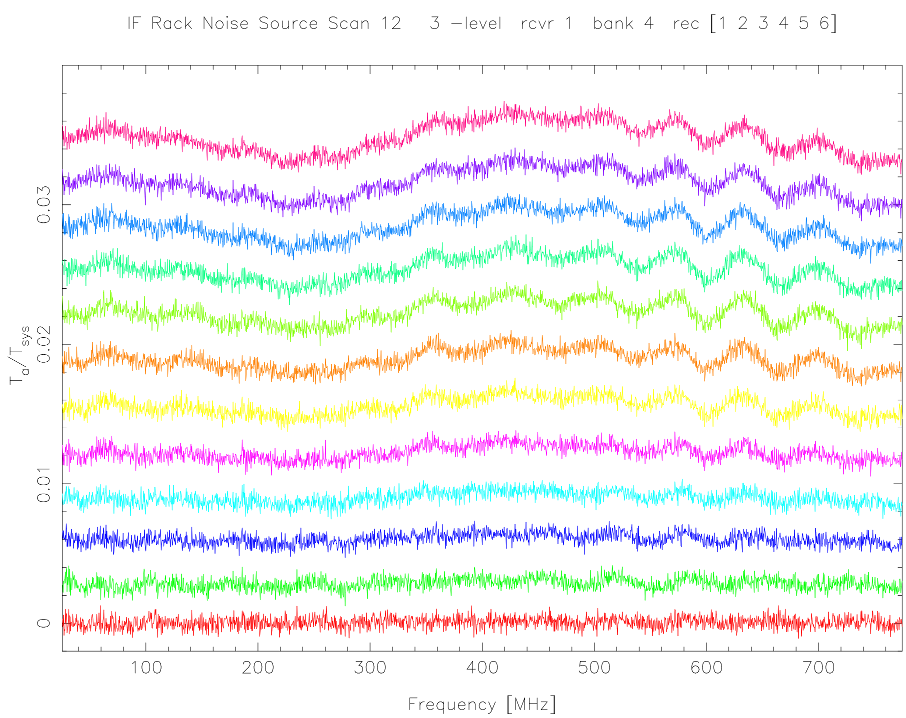

Figure 4: $(sig - ref)/ref$ for Scans 12-23, with Scan 11 as the reference, for the OR1/CM4/SF4 IF path.

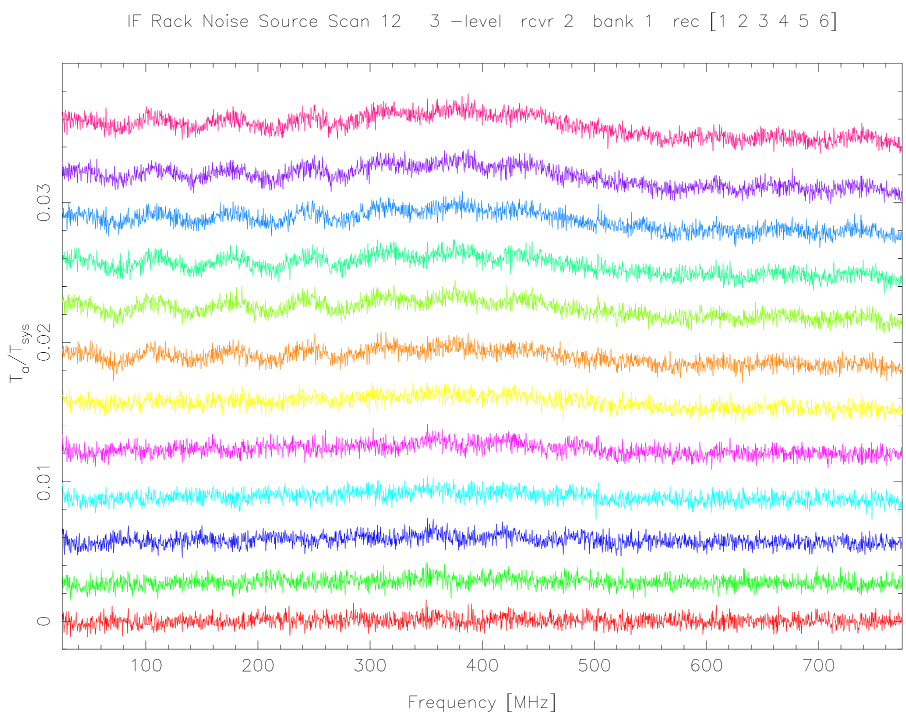

Figure 5: $(sig - ref)/ref$ for Scans 12-23, with Scan 11 as the reference, for the OR3/CM5/SF5 IF path.

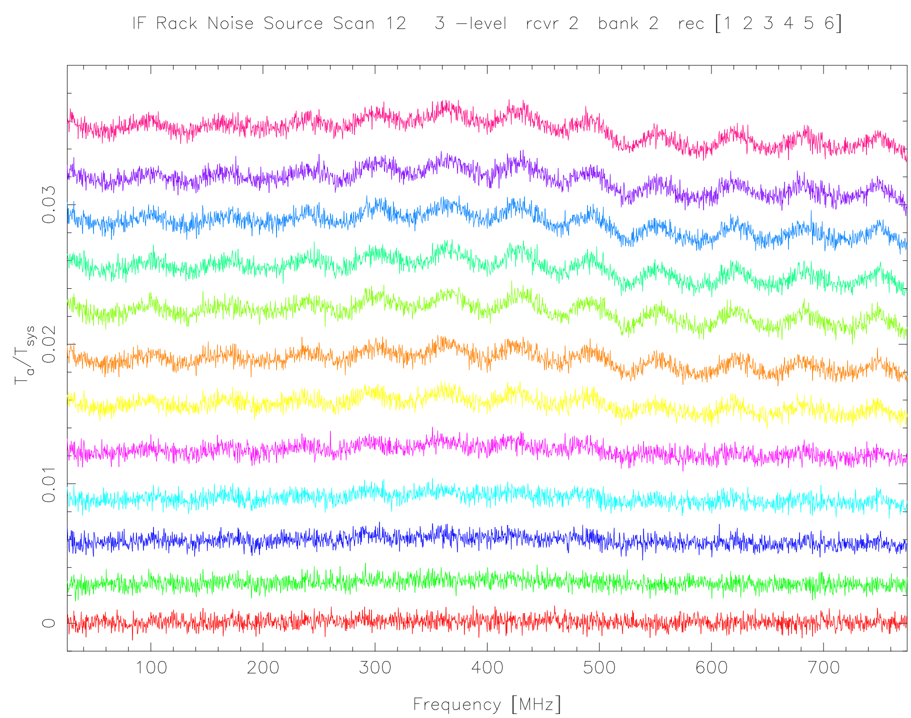

Figure 6: $(sig - ref)/ref$ for Scans 12-23, with Scan 11 as the reference, for the OR3/CM6/SF6 IF path.

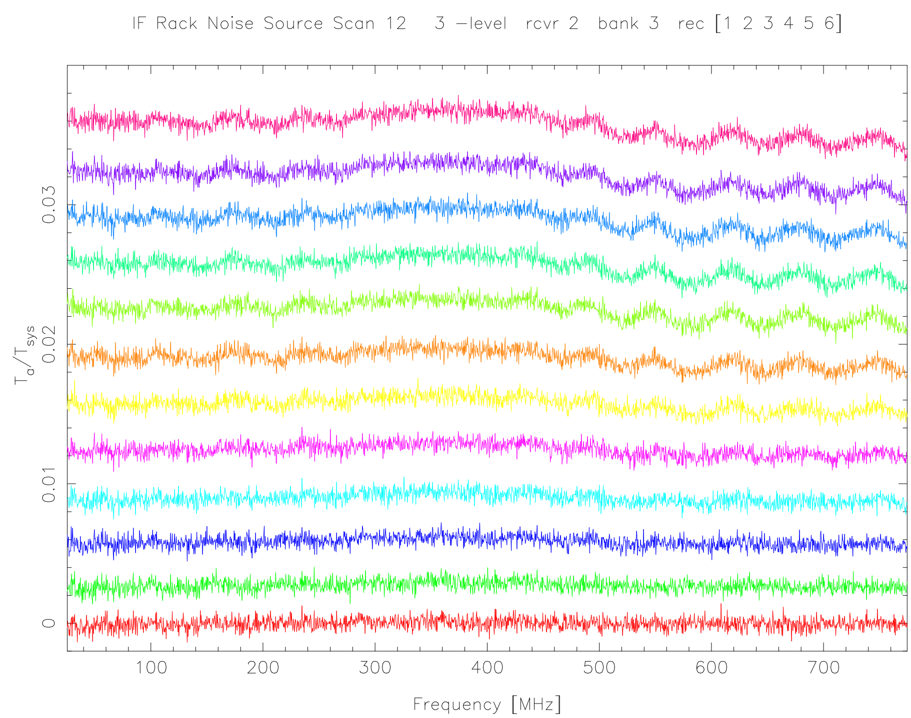

Figure 7: $(sig - ref)/ref$ for Scans 12-23, with Scan 11 as the reference, for the OR3/CM7/SF7 IF path.

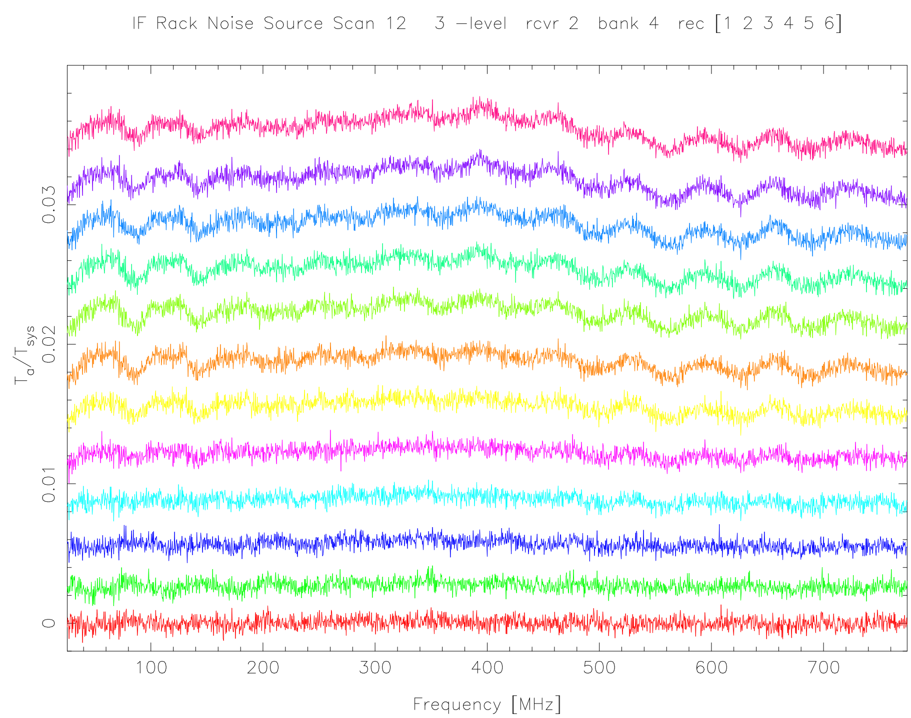

Figure 8: $(sig - ref)/ref$ for Scans 12-23, with Scan 11 as the reference, for the OR3/CM8/SF8 IF path.

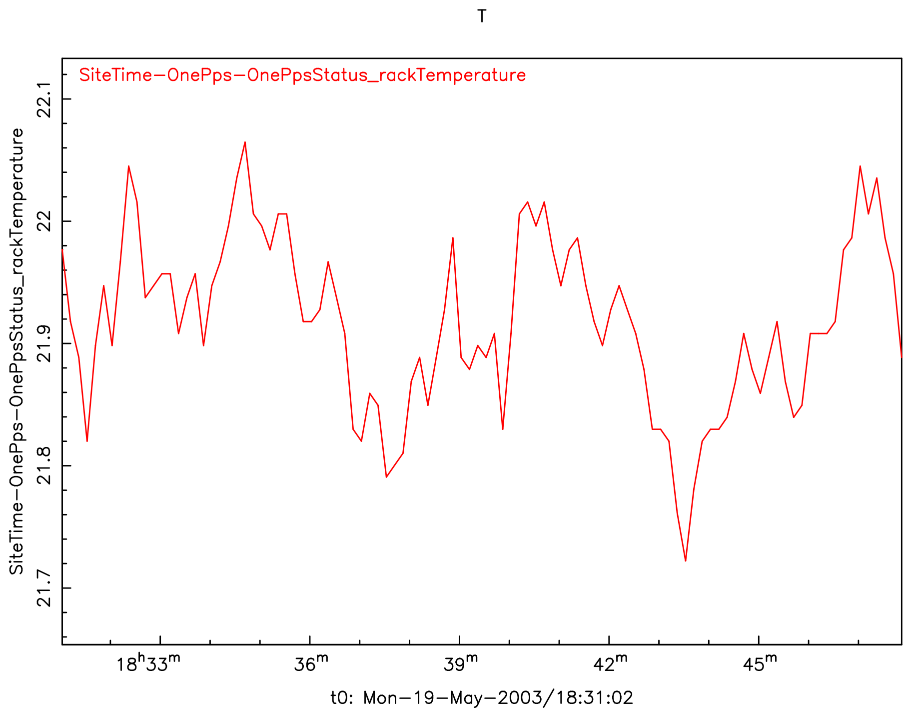

Figure 9: Recorded air temperature within Converter Rack A during scans 11-23.

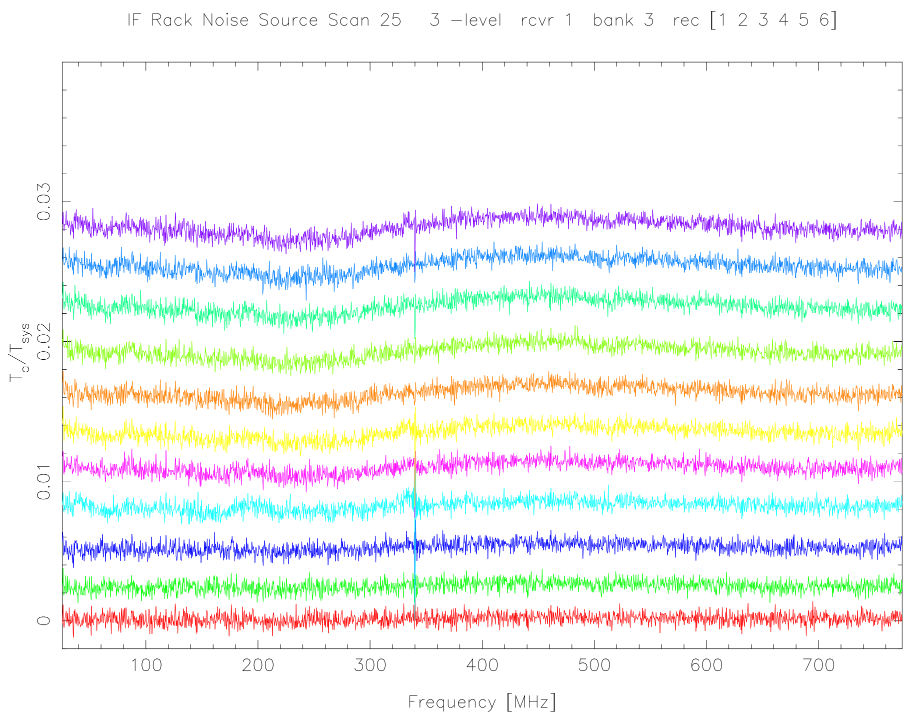

Figure 10: $(sig - ref)/ref$ for Scans 25-35, with Scan 24 as the reference, for the OR1/CM3/SF3 IF path. Other OR1 outputs were terminated during these scans.

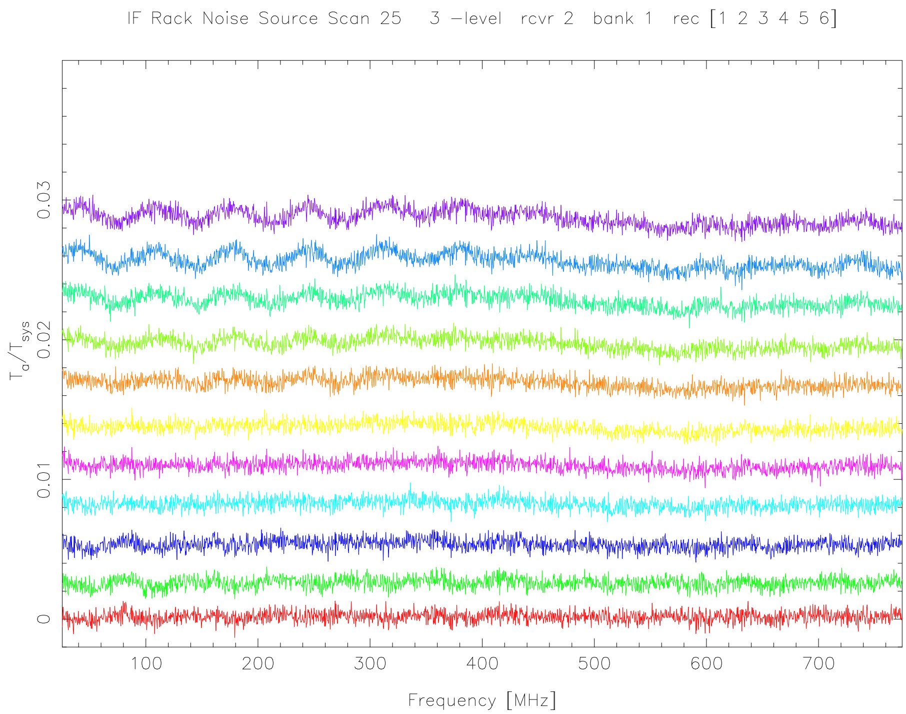

Figure 11: $(sig - ref)/ref$ for Scans 25-35, with Scan 24 as the reference, for the OR3/CM5/SF5 IF path.

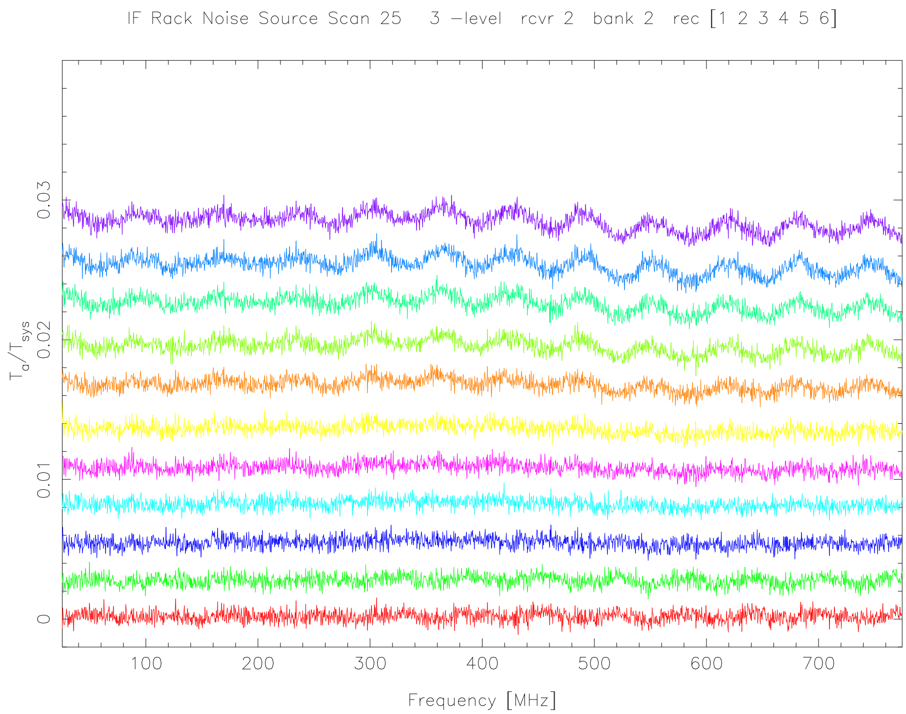

Figure 12: $(sig - ref)/ref$ for Scans 25-35, with Scan 24 as the reference, for the OR3/CM6/SF6 IF path.

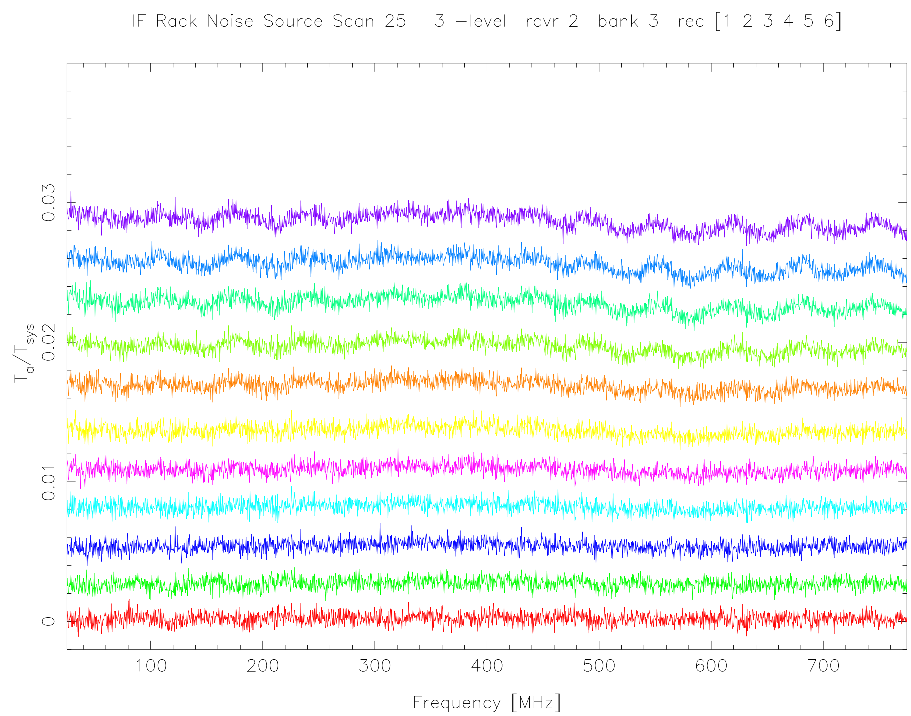

Figure 13: $(sig - ref)/ref$ for Scans 25-35, with Scan 24 as the reference, for the OR3/CM7/SF7 IF path.

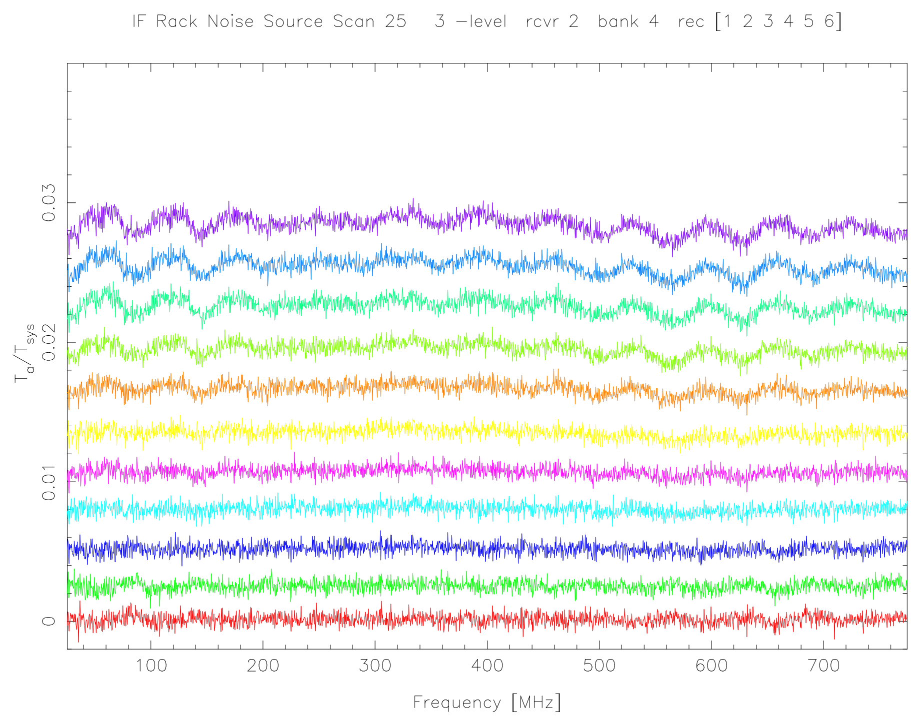

Figure 14: $(sig - ref)/ref$ for Scans 25-35, with Scan 24 as the reference, for the OR3/CM8/SF8 IF path.

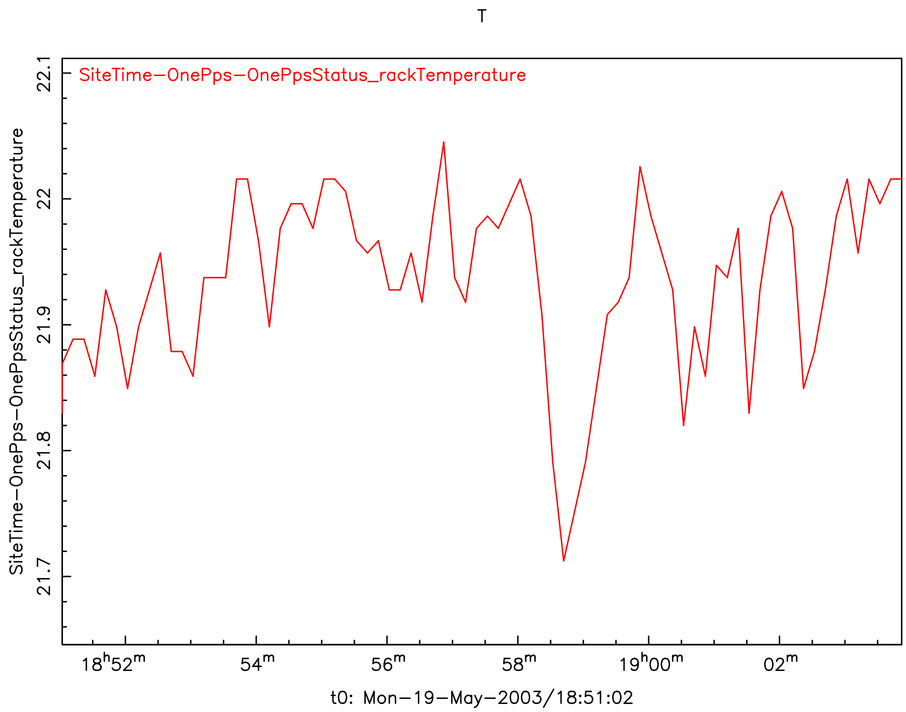

Figure 15: Recorded air temperature within Converter Rack A during scans 24-35.