

Wettzell maser performance plus simulation

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1. Introduction

I have superposed the random walk/integrated random walk simulated clock Allan Standard Deviation on the figure of the clock performance differenced between four masers at Wettzell measured by Wolfgang Schlueter. An ASD of $1e-4$ at 50 minutes is very conservative compared to the raw maser performance when the masers are located in the same building.

2. Results

The Allan Standard Deviations of the measured differences among four masers at the Wettzell Fundamental Station are shown in Figure 1.

I used the matlab script *predictclock_rwirw* written by Johannes Boehm to calculate clock values for ASD of $1.4e-14$ at 50 minutes, which actually comes out to be about $2e-14$ at 50 minutes because of the addition of the random walk and the integrated random walk. I have superposed this ASD on Figure 1.

The ASD for the simulated data is for only one clock. The curves for the Wettzell masers are the ASDs of the differences between two masers, so for an individual maser would be lower by about 30%.

So I think we are being too conservative in using $1e-14$ at 50 minutes, but if the height repeatability is as insensitive as the simulations show, this doesn't matter. On the other hand, we are not following our general philosophy of being as realistic as possible.

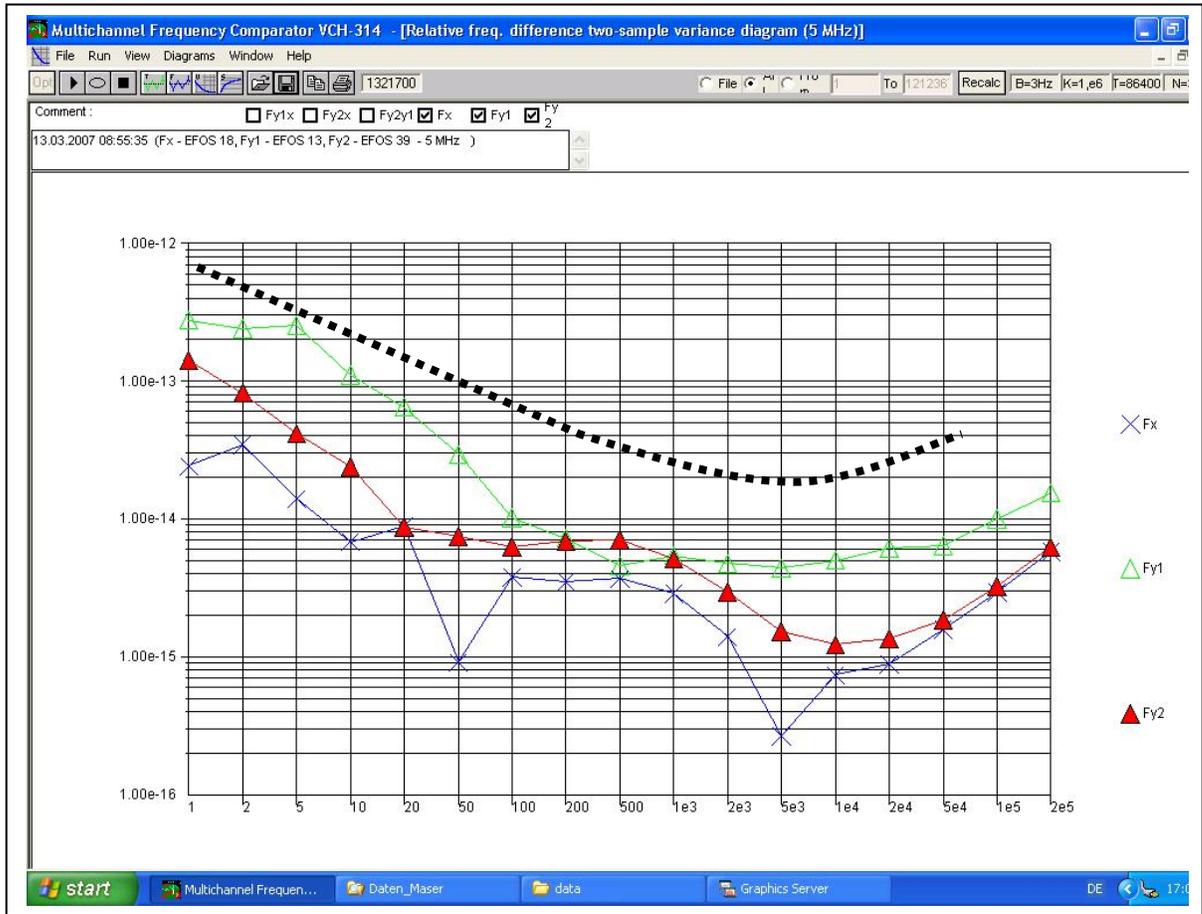


Figure 1. Allen Standard Deviations between pairs of masers at Wettzell Fundamental Station. The dashed heavy black line is the ASD for a process generated using *predictclock_rwirw* (matlab script by Johannes Boehm) using $1.e-14$ as the random walk parameter.
 (c:\aa\ivs\vlbi2010\masers\H-Masers_Comparison_Wtzl.jpg)