FREQUENCY COMPARISON (H_MASER 40 0889) - (LNE-SYRTE-FOM) From MJD 54224 to MJD 54234

The primary frequency standard LNE-SYRTE-FOM was compared to the hydrogen Maser (40 0889) of the laboratory, from MJD 54224 to MJD 54234.

The mean frequency differences measured between the hydrogen Maser 40 0889 and fountain FOM during this period is given in table 1.

Period (MJD)	y(HMaser$_{40\ 0889}$ - FOM)	u_B	u_A	$u_{link\ /\ maser}$
54224 – 54234	**-11911,2**	**9,3**	**4,1**	**1,1**

Table 1: Results of the comparison in 1 x 10^{-16}.

Figure 1 collects the measurements of fractional frequency differences during the MJD 54224 (4th May 2007) to MJD 54234 (14th May 2007), averaged by interval of 12 hour.

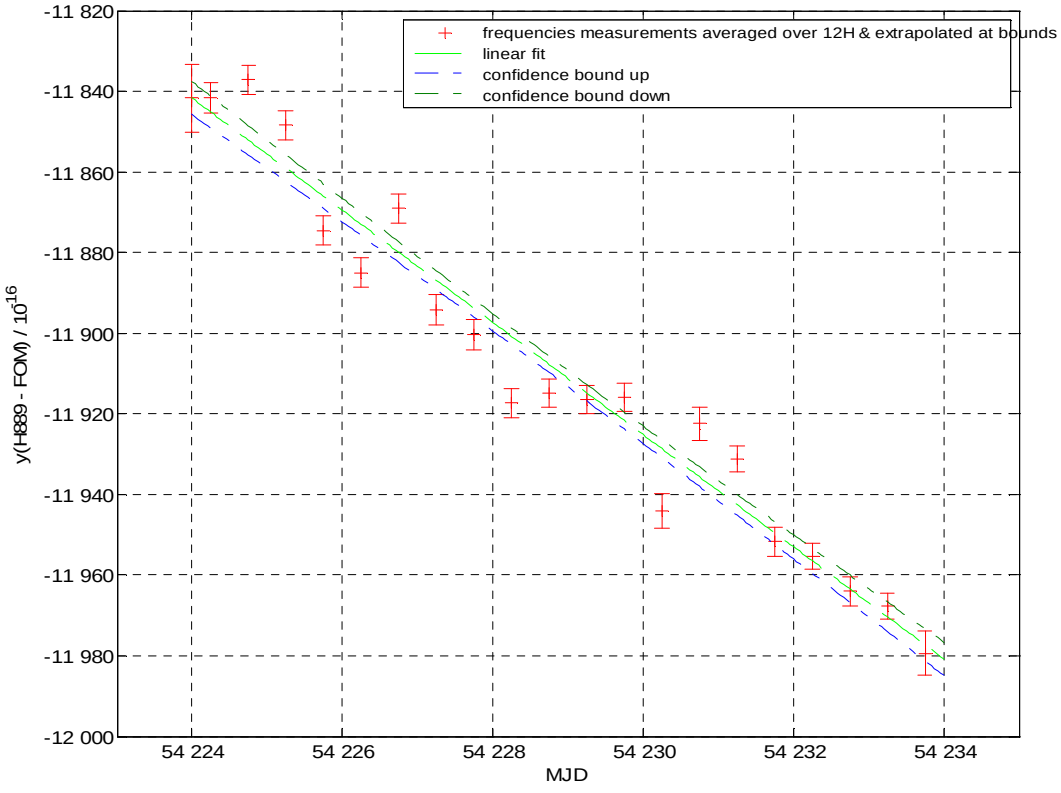

Figure 1: Fractional Frequency averaged over 12H and associated uncertainty of H889-FOM during the period 54224 to 54234. The weighted linear fit and, the confidence bounds up and low at ± 1σ were represented in dashed lines.

Uncertainties budget of systematic effects in the FOM fountain

Systematic effects taken into account are the quadratic Zeeman, the Black Body, the cold collision and cavity pulling, the microwave leakage and the 1st Doppler effects, the Ramsey Rabi pulling, the recoil, the 2nd Doppler and the background collisions. The red shift effect is also included in the systematic uncertainty budget. Systematic uncertainty is estimated by the sum of quadratic systematic uncertainties. The following table summarizes the budget of systematic effects and their associated uncertainties. More details on systematic effects are developed in the next paragraphs.

	Correction (10^{-16})	**Uncertainty (10^{-16})**
Quadratic Zeeman effect	- 210.2	1.1
Black body radiation	160.45	0.6
Cold collisions and cavity pulling	39.5	6.7
Microwave power dependence	0	6
Ramsey & Rabi pulling	0	< 0.1
Microwave recoil	0	< 1.4
Second order Doppler effect	0	< 0.1
Background gas collisions	0	<1.0
Total		**9,2**
Red shift	- 68	1.0
Total with red shift		**9,3**

Table 1: budget of systematic effects and uncertainties for SYRTE-FOM fountain

For the May 2007 period it gives:

$$u_B = 9.3 \times 10^{-16}$$