FREQUENCY COMPARISON Hydrogen MASER 40 0890 with LNE-SYRTE-**FO1**
From MJD 54189 to MJD 54219

The primary frequency standard LNE-SYRTE-FO1 was compared to the hydrogen Maser (40 0890) of the laboratory during the 30th March to 29th April 2007 period, from MJD 54189 to MJD 54219.

The mean frequency differences measured between the hydrogen Maser 40 0890 and fountain FO1 during this period is given in Table 4.

Period (MJD)	y(HMaser$_{40\ 0890}$ - FO1)	u_B	u_A	$u_{link\ /\ maser}$
54189 – 54219	-3828,7	4,2	2,7	1,4

Table 4: Results of the comparison in 1 x 10^{-16}.

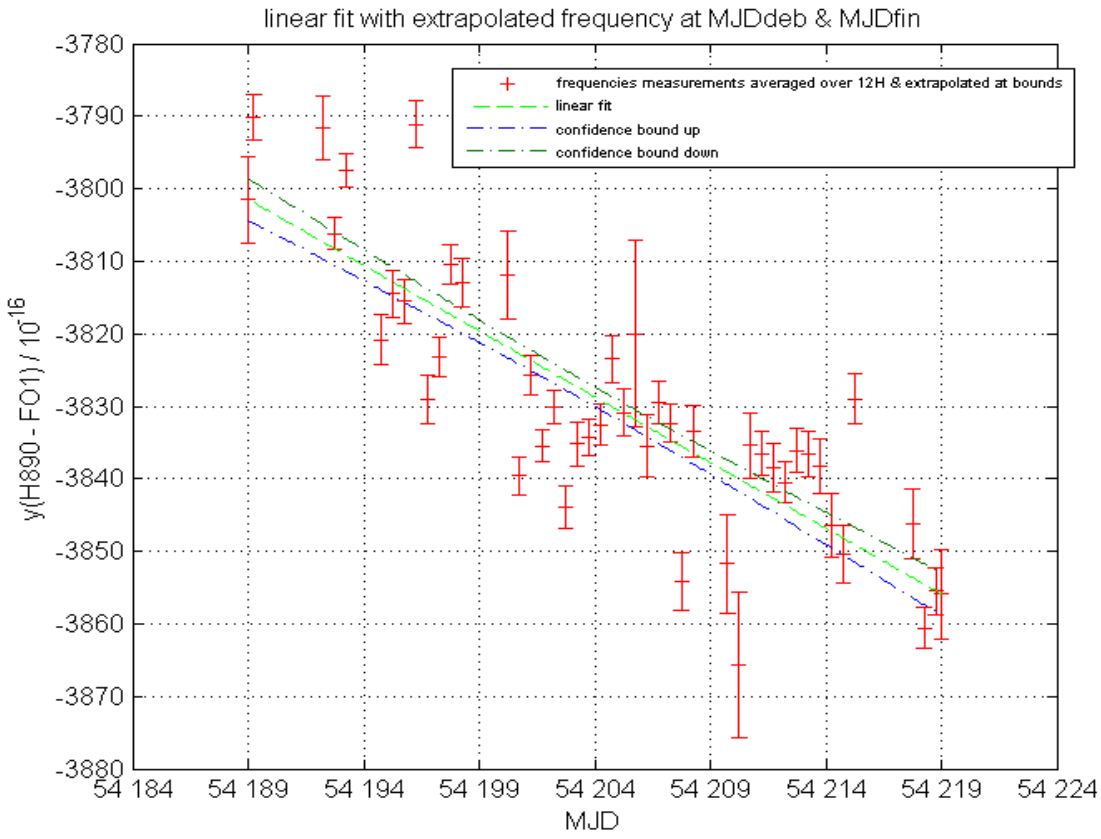

Figure 2: Fractional frequency averaged over 12H with associated statistical uncertainty of H890-FO1 during the period MJD 54189 to MJD 54219. The weighted linear fit with the confidence bounds up and low of 1σ are represented in dashed lines.

Table 5 gives a statistical synthesis of measurements and the results of the average calculation using different methods. Linear fit method was selected to estimate the average and the statistical uncertainty associated.

Dates Duration & Measurement Rate	Mean frequency difference normalized $y_{Maser} - y_{FO1}$	type A uncertainty σ_{Stat} & $\sigma_{Collision}$	Uncertainty due to the dead times $\sigma_{deadTime}$
BIPM interval Start date MJD UTC **54189,0** Stop date MJD UTC **54219,0** Length of interval 30 d Measurement Rate: 69,86% mean duration between measurements τ_0 = 209241 s	Mean by linear fit at middle date 54204 of BIPM interval: $\bar{y}$ = **- 3828,7 x 10^{-16}** Mean by polynomial fit order 5: $\bar{y}$ = **- 3829,5 x 10^{-16}**	Uncertainty of linear fit at 1σ σ_A = **2.68 x 10^{-16}** Allan Deviation at T with assumption of White Frequency Noise σ_y = **1.37 x 10^{-16}**	$\sigma_{deadTime}$ = **1,02 10^{-16}**

Table 5: Statistics resumes of SYRTE-FO1 fountain measurements.

Table 6 resumes the budget of systematic effects and their associated uncertainties. More details on systematic effects and uncertainty due to the dead time are developed in the last TAI calibration by FO1 in December 2006.

	Correction (10^{-16})	**Uncertainty (10^{-16})**
Quadratic Zeeman effect	-1242.8	0.3
Black body radiation	+165.2	1.0
Cold collisions and cavity pulling	+201.4	2.4
First order Doppler effect		< 3.2
Microwave spectral purity		< 0.1
Microwave leaks		< 0.6
Synchronous phase fluctuations		< 0.6
Background gas collisions Microwave recoil		< 0.3 < 1.4
Ramsey & Rabi pulling		< 0.1
Second order Doppler effect		< 0.1
Total		**4.1**
Red shift effect	69,3	1.0
Total with red shift		**4.2**

Table 6: budget of systematic effects and uncertainties for SYRTE-FO1 fountain