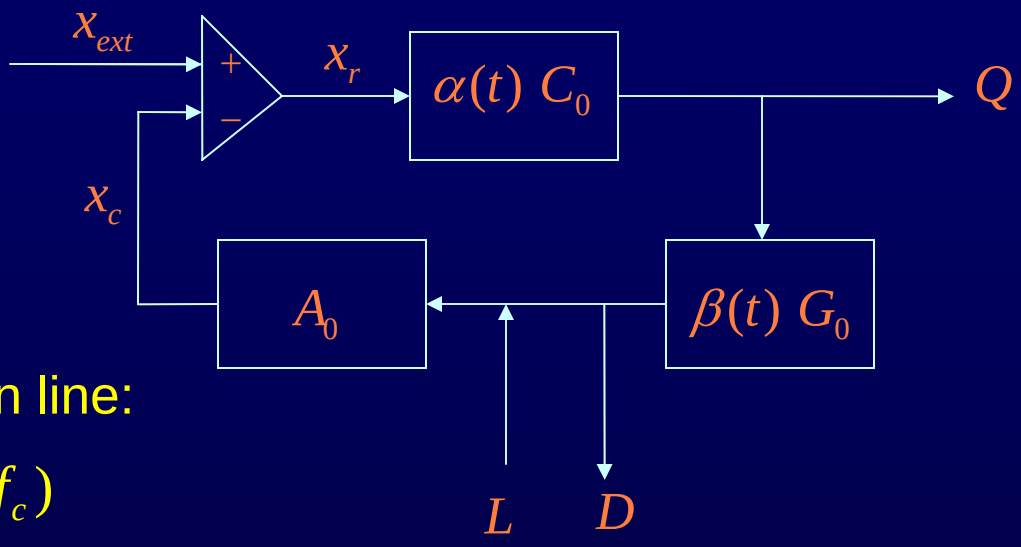
S3: Timescale for calibration factors



At the frequency of the calibration line:

$$x_r(f_c) = x_{ext}(f_c) - x_c(f_c) \approx -x_c(f_c)$$

Using this and going around the loop we obtain:

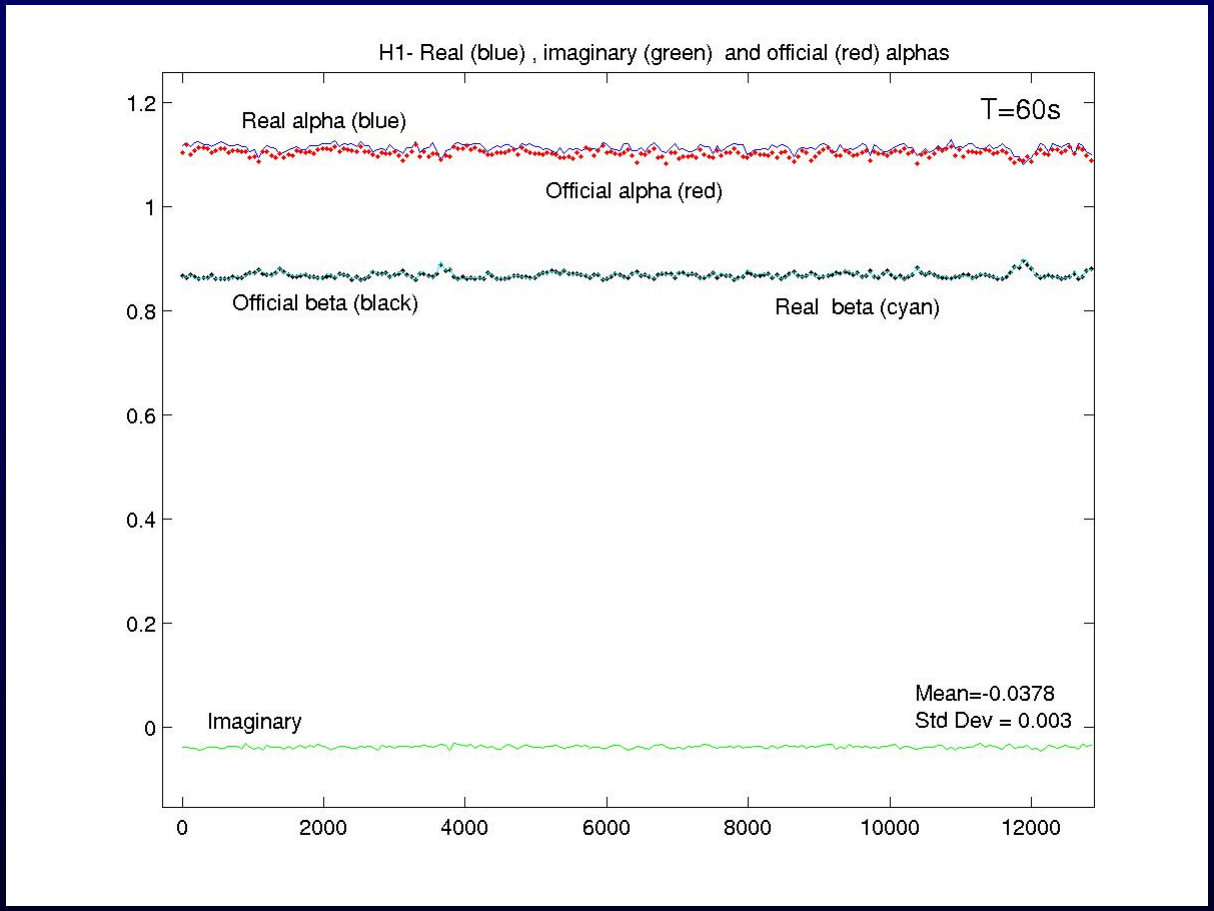
$$\alpha(t)\,\beta(t) \approx -\frac{1}{H_0}\frac{D(f_c)/L(f_c)}{1-D(f_c)/L(f_c)}$$

$$\alpha(t) \approx -\frac{1}{H_0}\frac{Q(f_c)\left(1+\alpha(t)\beta(t)H_0(f_c)\right)}{C_0(f_c)A_0(f_c)L(f_c)}$$

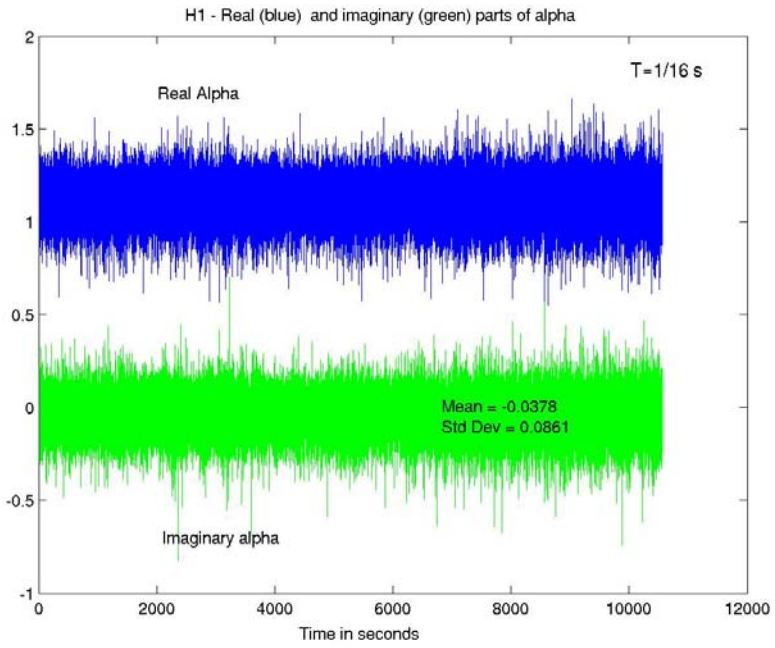
These quantities have an imaginary part to the extent to which the external signal contaminates the calibration line.

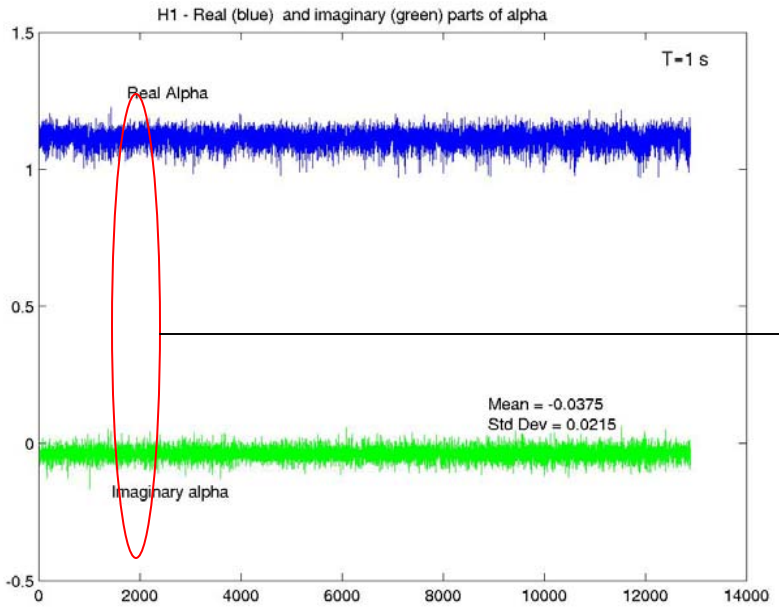
Implemented in LAL/LALapps

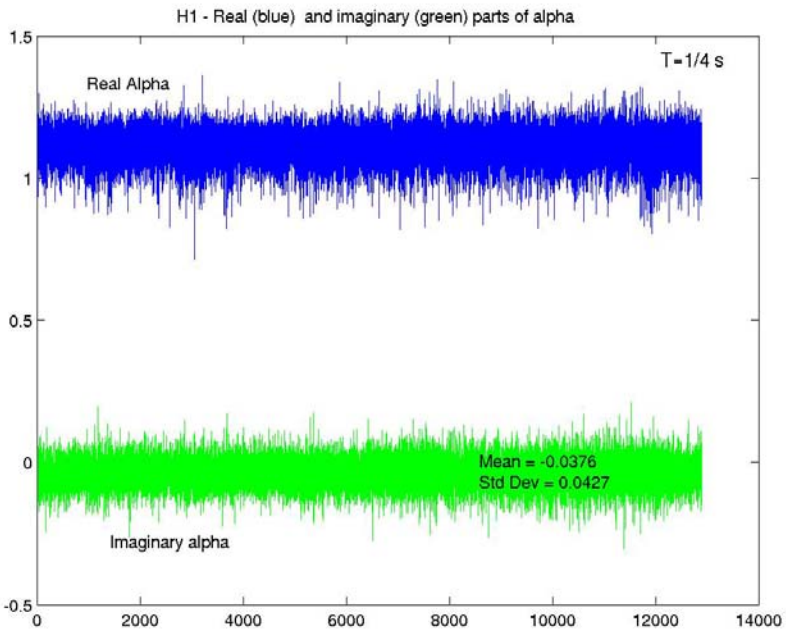
H1 - Comparison with official factors:

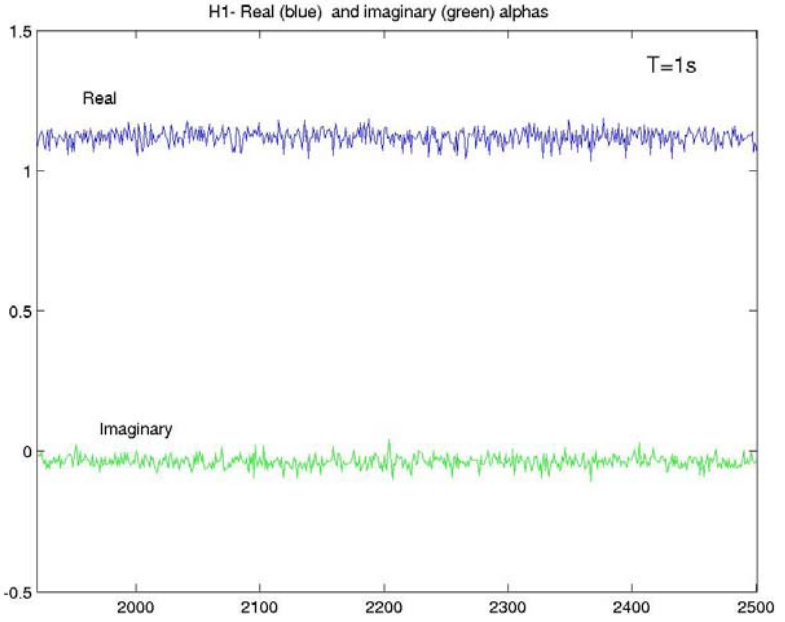


H1 – Different time-scales:

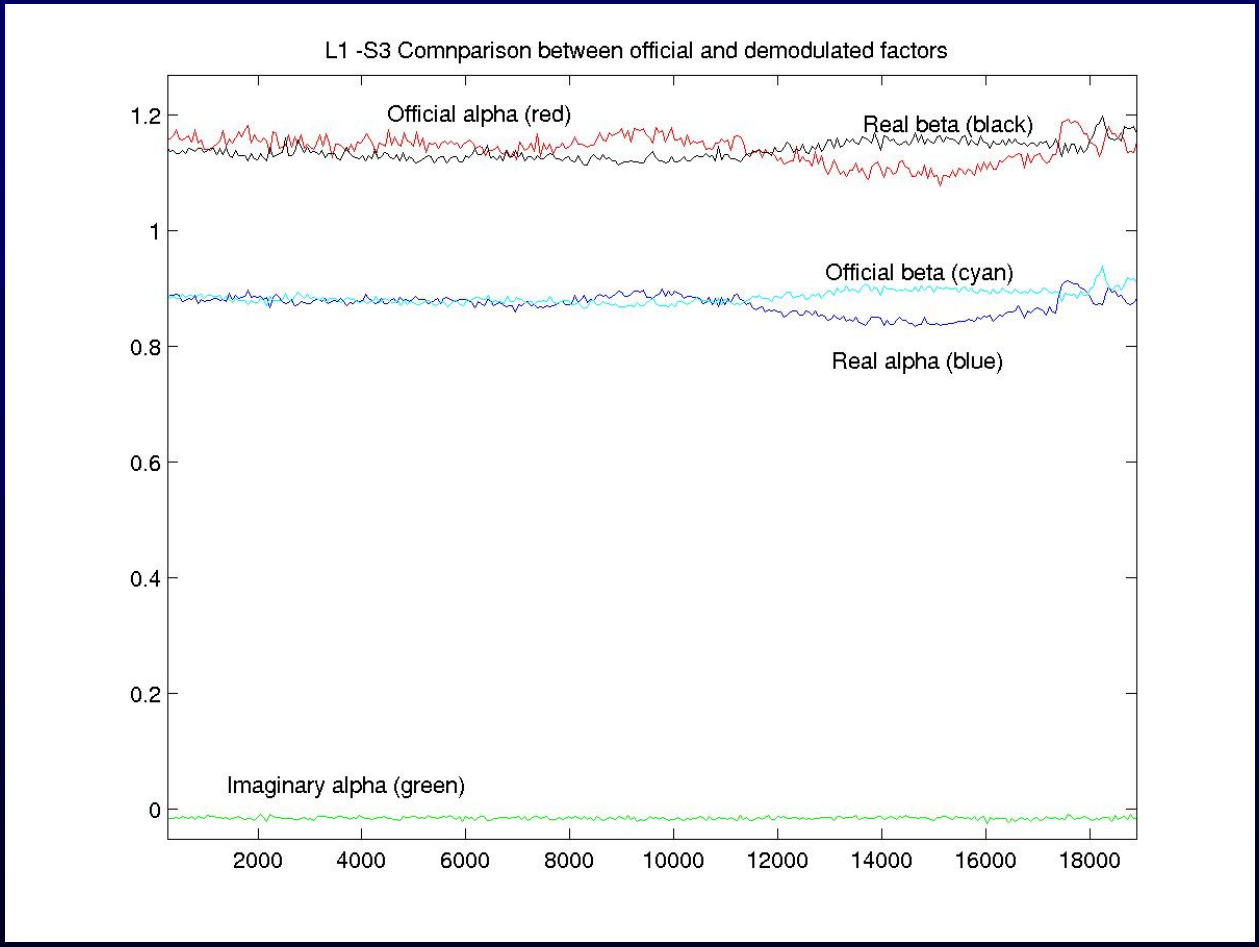






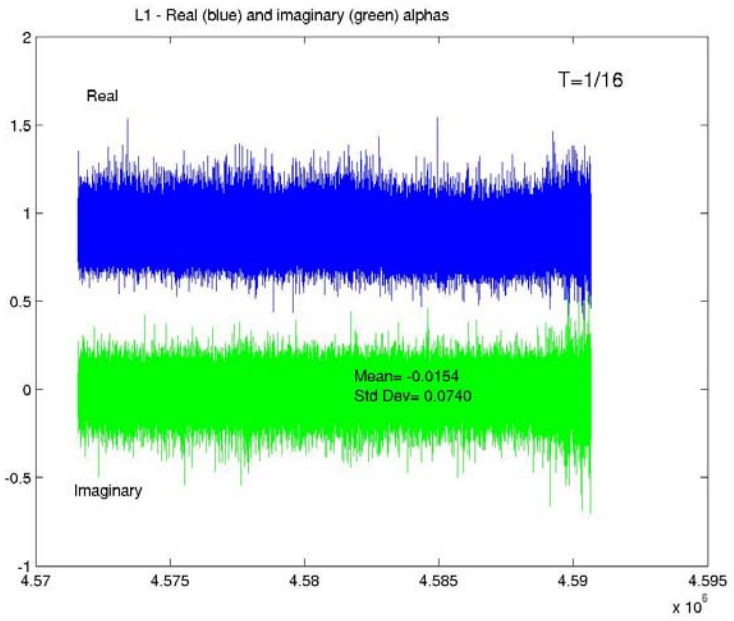


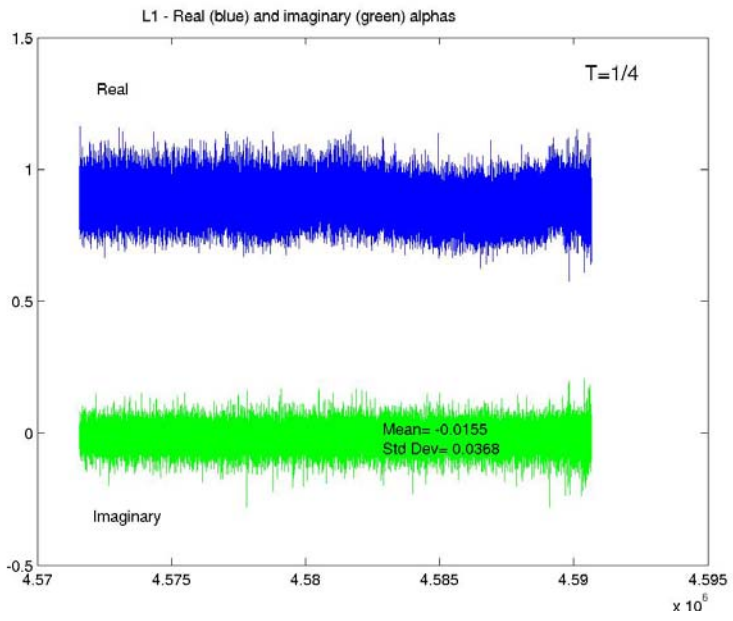
L1 - Comparison with official factors:

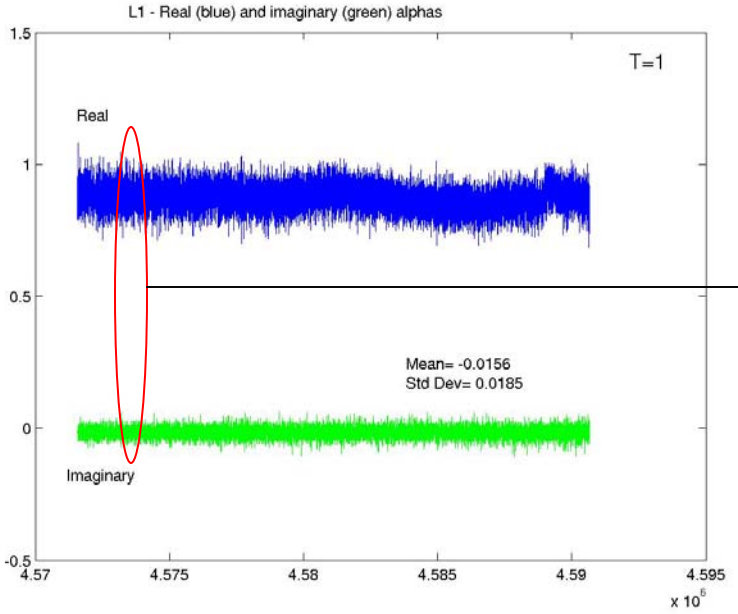


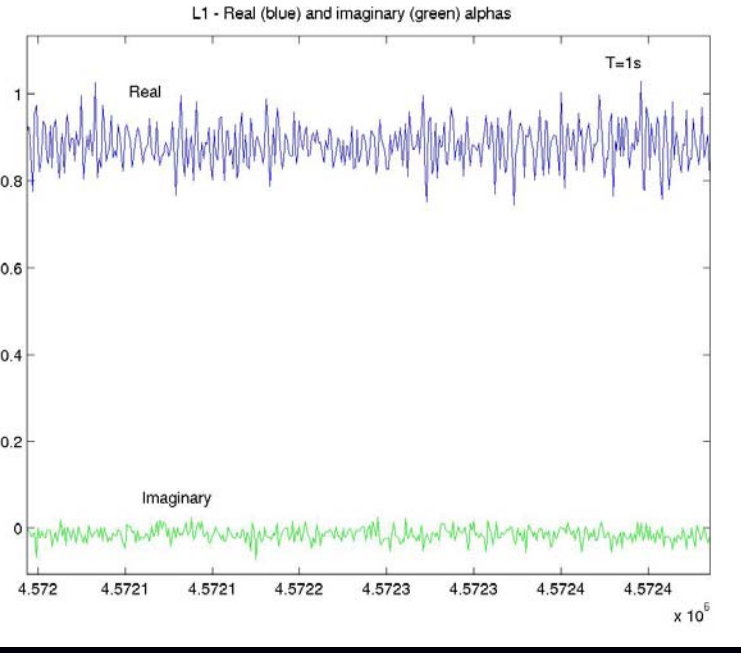
A bit of a mess…

L1 – Different time-scales:









Conclusion:

- Open up discussion about good time-scales (1s?)

- Claims of systematic errors believable ??

- What is going on with L1?