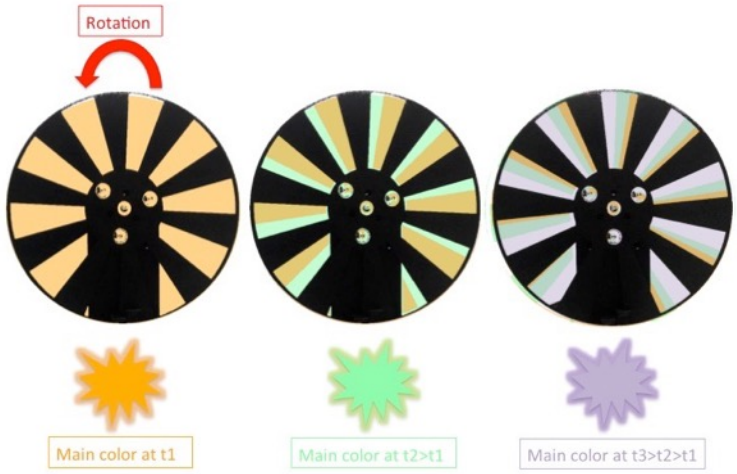
**Figure 1 : Emergence of colorful fringes on the optical chopper.**

**a.**

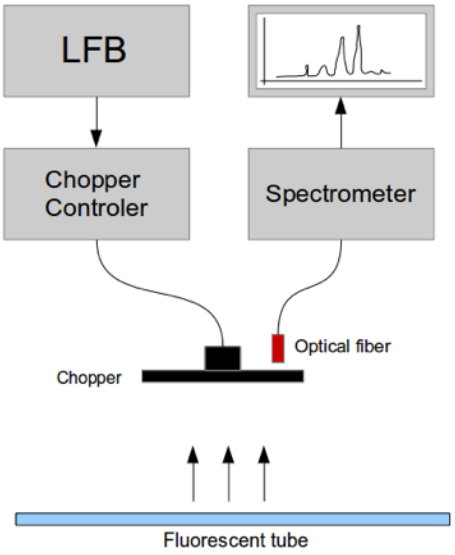
**b.**




**a.** Image of colorful fringes on the optical chopper. This cliche is obtained by rotating the chopper at $\omega$ =100Hz while it is enlightened by a light-tube plugged into the mains (50Hz). **b.** When the fan is rotating different colors passe through with a delay and it creates the fringes. At t1 the main color is orange then the fan rotates and the color changes ; at t2 the main color is green, two distinct fringes appear : one green and one resulting of the addition of green and orange ; at t3 the process continues with a new color. The fringes can be associated with the oscillation of the light-tube's emission spectrum (f =100Hz). We may note that the visible-light emission is due to fluorophores. Here fluorophores have long lifetimes (around 1ms) thus the fringes are visible. At f =100Hz the fringes freeze : the optical chopper works as a stroboscope.

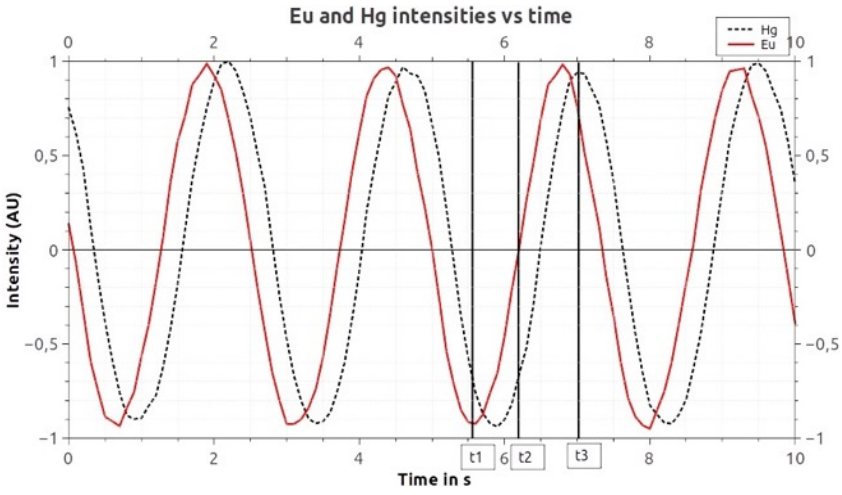
**Figure 2 : Acquisition of the intensity fluctuation for the spectral line $\lambda$ =611nm, using an optical fiber.**

**a.**

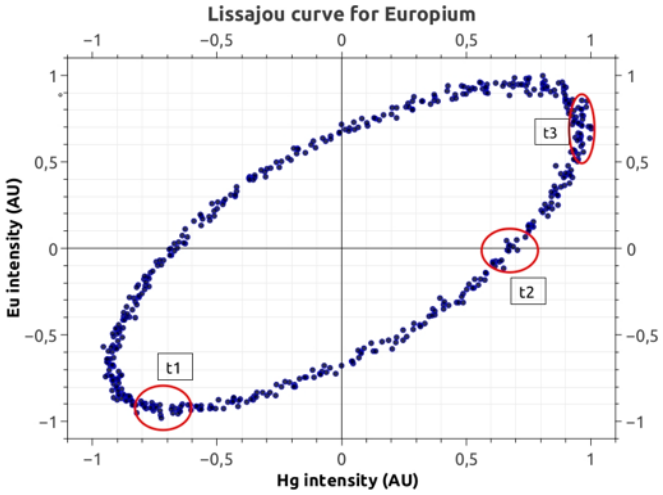



**b.**

**c.**

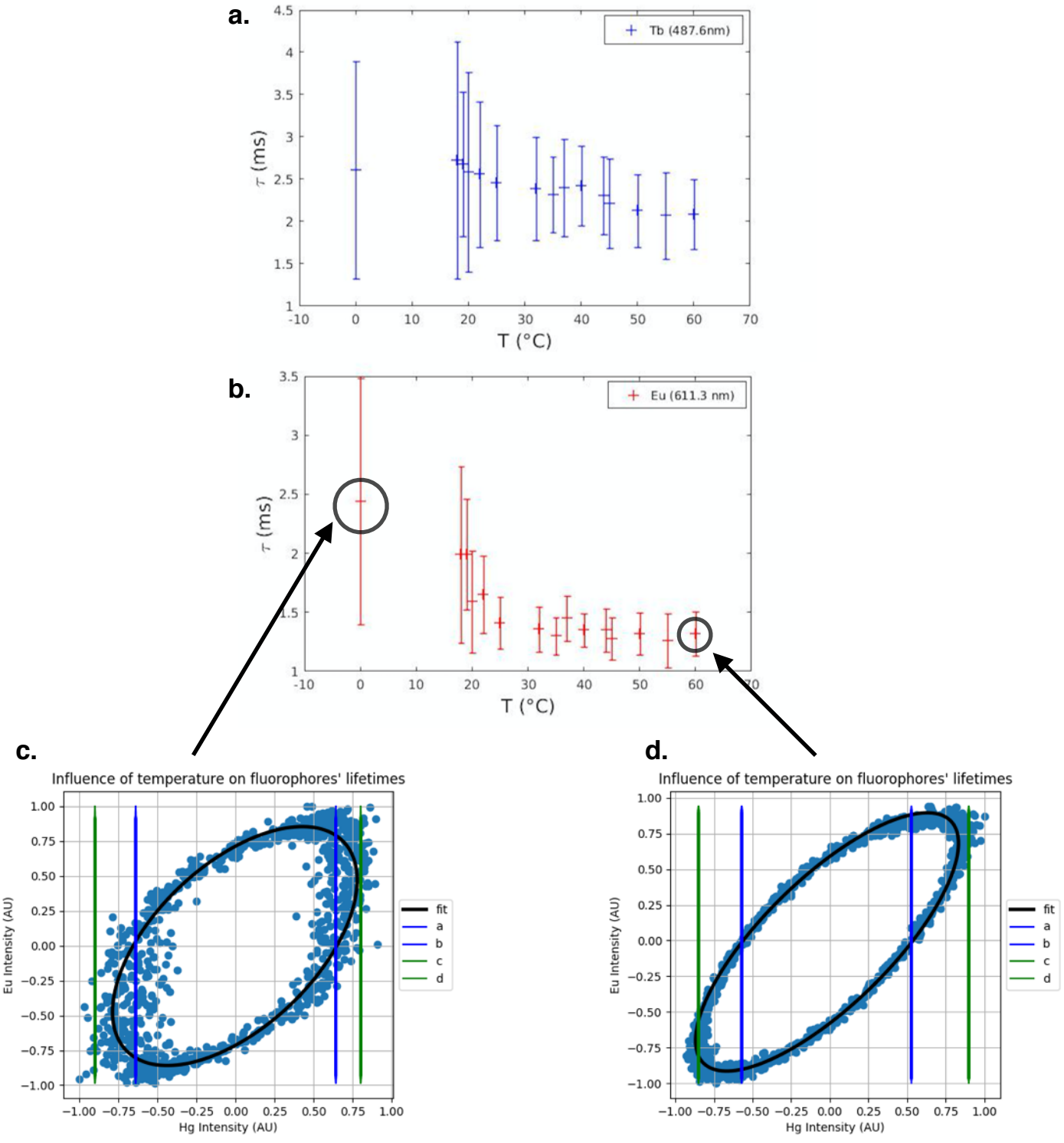



**d.**




**a.** Experimental setup : the LFB delivers a square wave (0-5V at f = 1004Hz). The chopper controller divides the frequency by 10, thus the chopper rotates at f = 100,4Hz. The acquisition is made by the spectrometer using an optical fiber. **b.** Image of the chopper with the optical fiber. **c.** Fluctuations of the spectral lines $\lambda$ =611nm (Eu complex) and $\lambda$ =435nm (Mercury gaz). **d.** Plot of the Eu spectral line intensity versus Hg spectral line intensity. We can see the correspondance of various instants t1,t2 and t3 on the previous chart (Fig 2.c).

**Figure 3 : Influence of the temperature on fluorophores' lifetimes.**




**a.** Influence of the temperature on Tb lifetime. **b.** Influence of the temperature on Eu lifetime. **c.** Lissajou plot : Eu intensity versus Hg intensity for T = 0°C. **d.** Lissajou plot : Eu intensity versus Hg intensity for T = 60°C.