

Calculating the b -values

In the **b_val_calc** folder, you will find:

- A .mat file named '*Sequence_Gradients.mat*': this file contains all the chronograms, i.e. it contains the RF and gradients information (for each directions and amplitudes).
- A matlab function named '*calc_b_sLASER.m*'

1. Open the **folder b_val_calc** in Matlab

2. Load the **.mat file (*Sequence_Gradients.mat*)** by either double clicking on the file or click right/load. This will automatically load in Matlab all the variables contained within the .mat file. A total of 28 variables are loaded:

- RF
- All gradients (imaging and diffusion) along the x, y and z directions (Gx, Gy and Gz). There are 9 different files for each x, y and z directions. Those 9 files are modulated in function of the direction and amplitude of the diffusion gradients. For instance:
 - *Gx_dir1_amp1* corresponds to the chronogram of the gradients along the x direction with the diffusion gradient being played along the first direction and with the first gradient amplitude
 - *Gy_dir1_amp1* corresponds to the chronogram of the gradients along the y direction with the diffusion gradient being played along the first direction and with the first gradient amplitude
 - *Gz_dir1_amp1* corresponds to the chronogram of the gradients along the z direction with the diffusion gradient being played along the first direction and with the first gradient amplitude
 - *Gx_dir3_amp3* corresponds to the chronogram of the gradients along the x direction with the diffusion gradient being played along the third direction and with the third gradient amplitude

3. To **calculate the b matrix (**b_matrix**) and the trace of the b matrix (**b_iso**)**, we will use the matlab function '*calc_b_sLASER.m*'. Here, we will calculate both **b_matrix** and **b_iso** for each gradient directions (dir1, dir2 and dir3) and each diffusion gradient amplitude (amp1, amp2 and amp3). The input of the function are RF, Gx, Gy, Gz. When running the Matlab function, the home-made routine will estimate the gradient moments and calculate the cross-terms, the b matrix (**b_matrix**), and the trace of the b matrix (**b_iso**). A total of 3 figures will also automatically be created. Figure 1 shows the sequence chronogram, figure 2 shows the gradient moments and figure 3 shows the cross-terms.

Example: when running in matlab in the command line the following:

```
[b_iso,b_matrix]=calc_b_sLASER(RF, Gx_dir1_amp1, Gy_dir1_amp1, Gz_dir1_amp1)
```

The matlab code will calculate the **b_iso** and **b_matrix** for the first direction and first amplitude of the diffusion gradients and will open the following figures:

