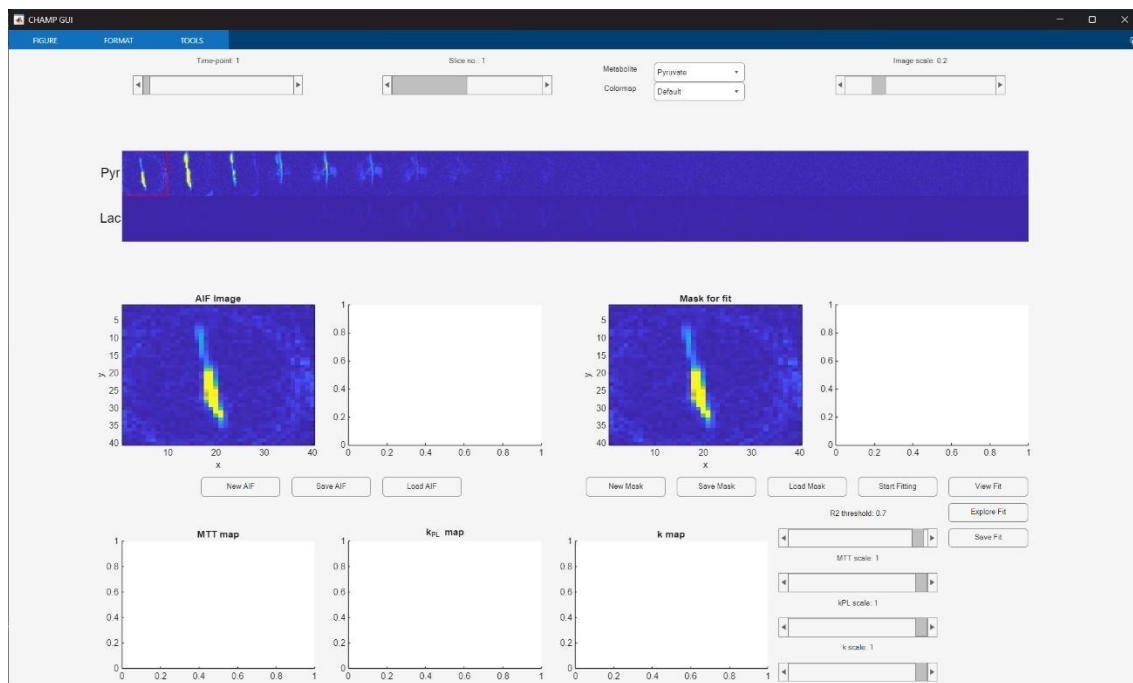


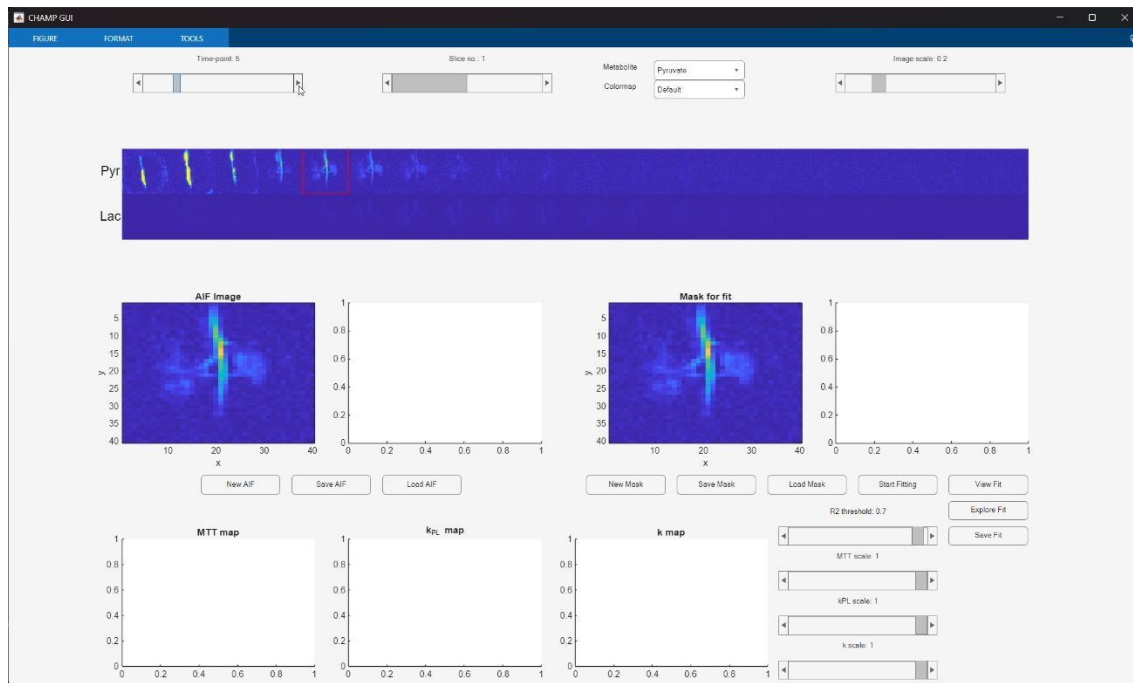
Usage guide to HEMEX Matlab GUI

April 2025, Nichlas Vous Christensen

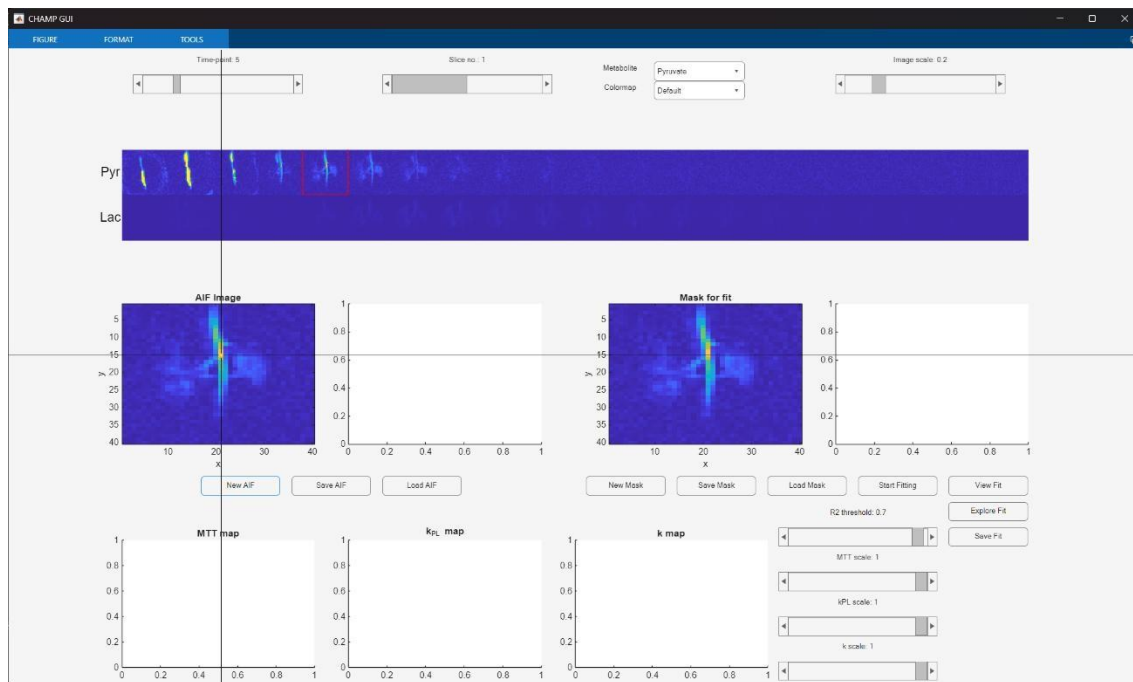
1. Make sure to install everything in `requirements.txt`
2. Run the `example_usage_GUI.m` file in Matlab with the example pig kidney dataset
3. The GUI will open as such:



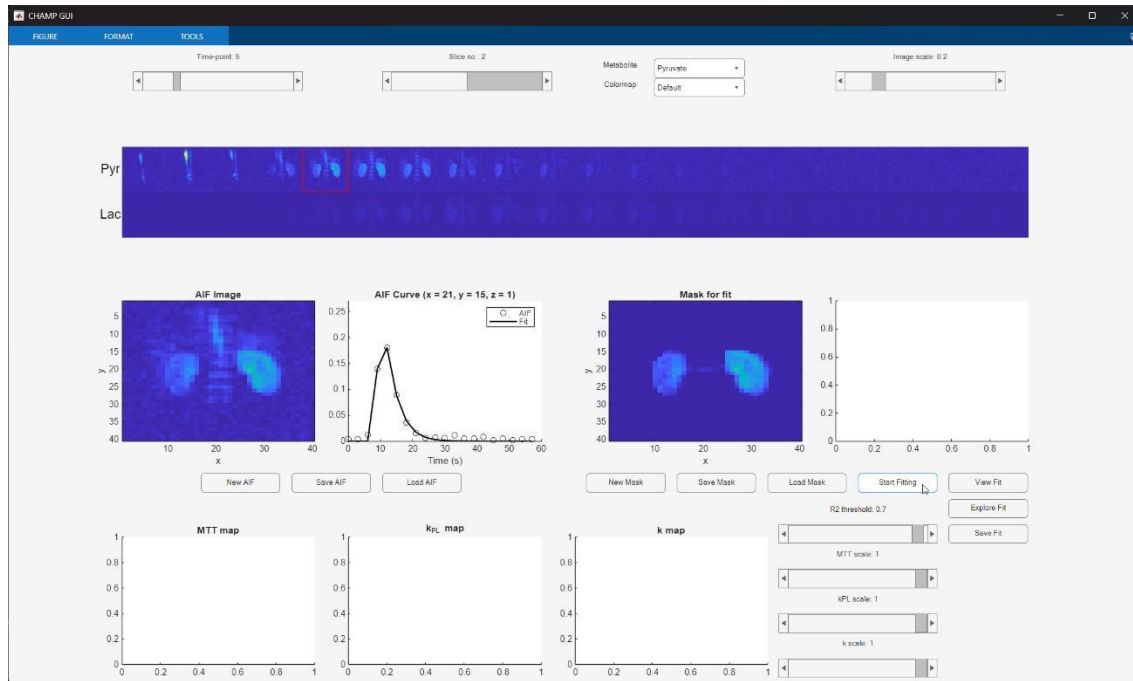
4. The GUI is currently displaying the highlighted box in the pyruvate/lactate dataset, e.g. timepoint = 1, slice = 1. Use the Time point slider to cycle through and find the best place to mask out the AIF:



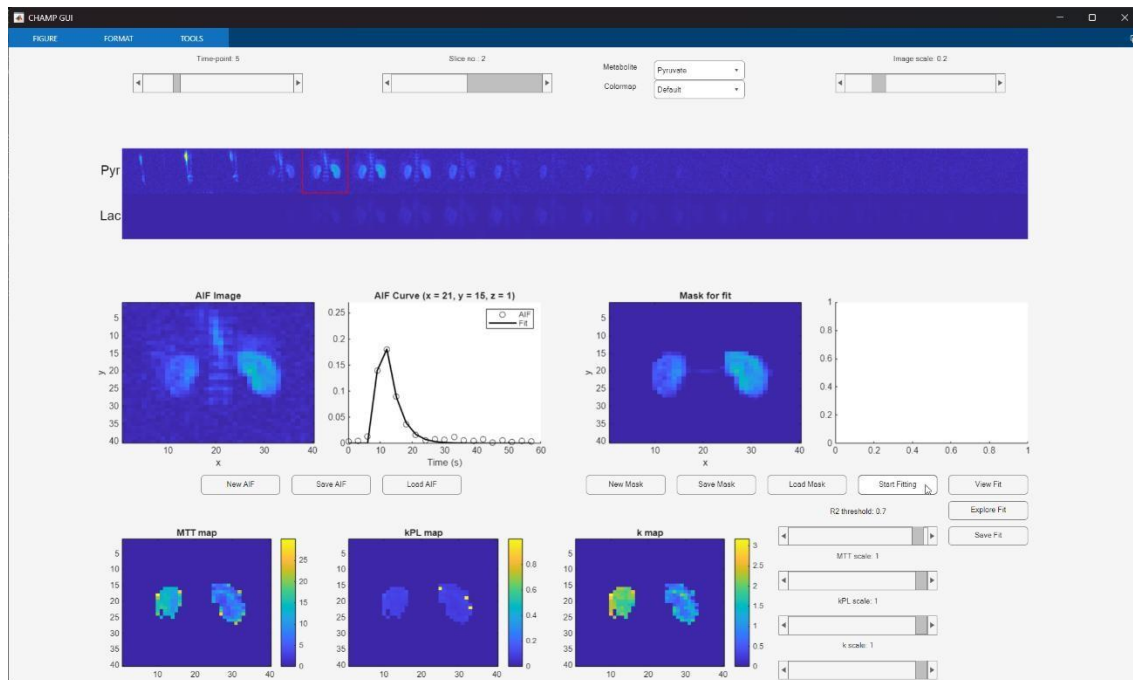
5. Use the New AIF button to pick out a voxel corresponding to the Arterial Input Function (AIF). Use Save/Load for later reloading.



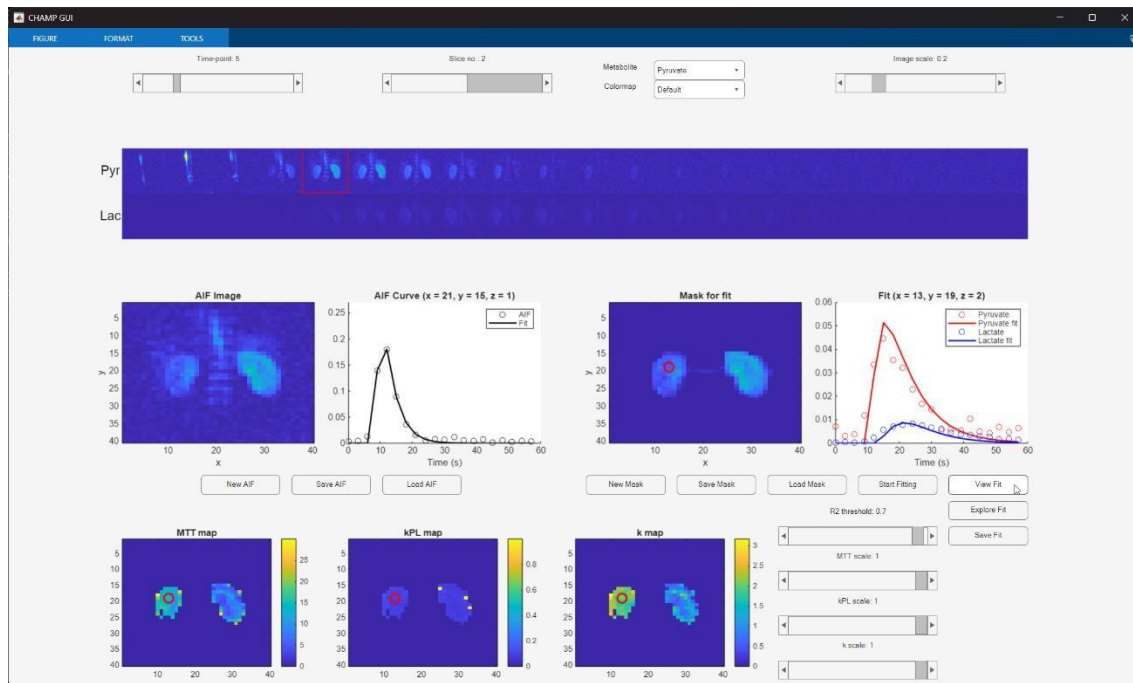
6. The AIF is fitted using a Shifted Gamma Variate, and plotted in the AIF box.



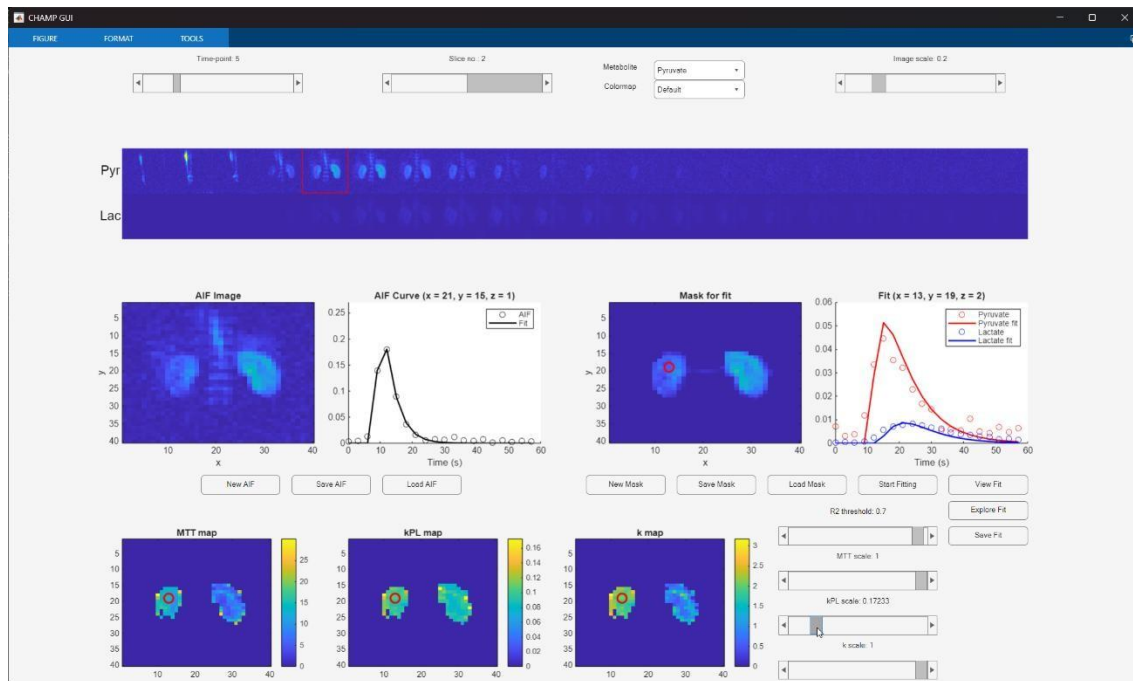
9. After masking out the kidneys, click the Start Fitting button. After the fitting has completed, the lower three windows will display the *MTT*, *kPL* and *k* maps.



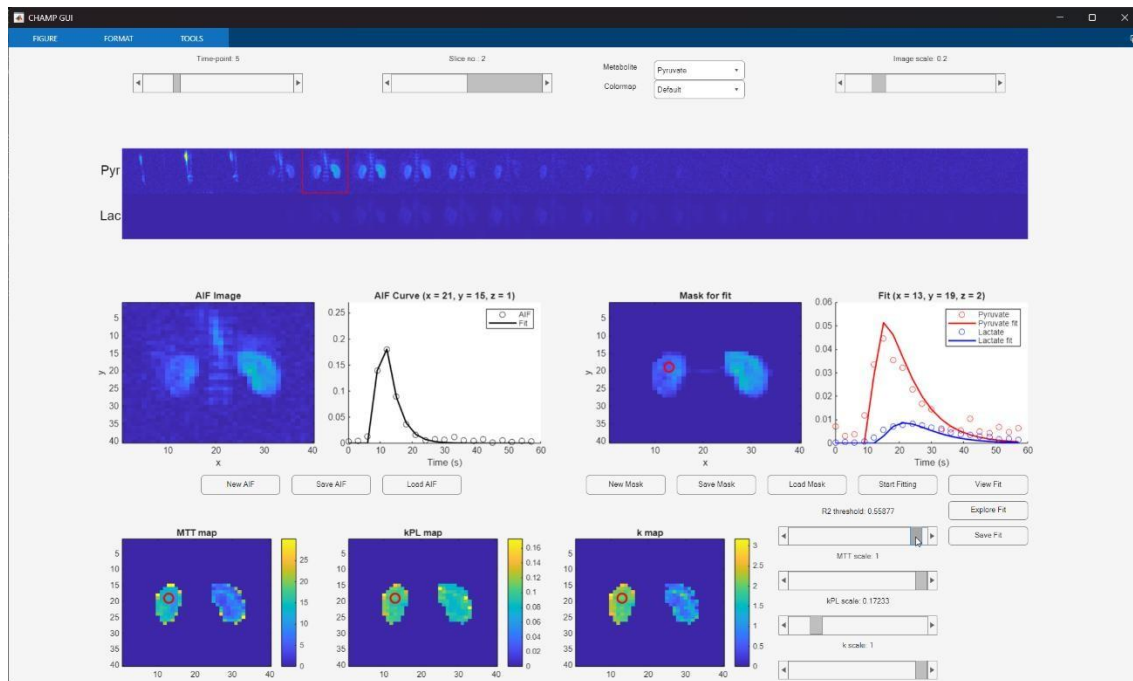
10. Using the View Fit button, the fit of a specific voxel can be displayed.



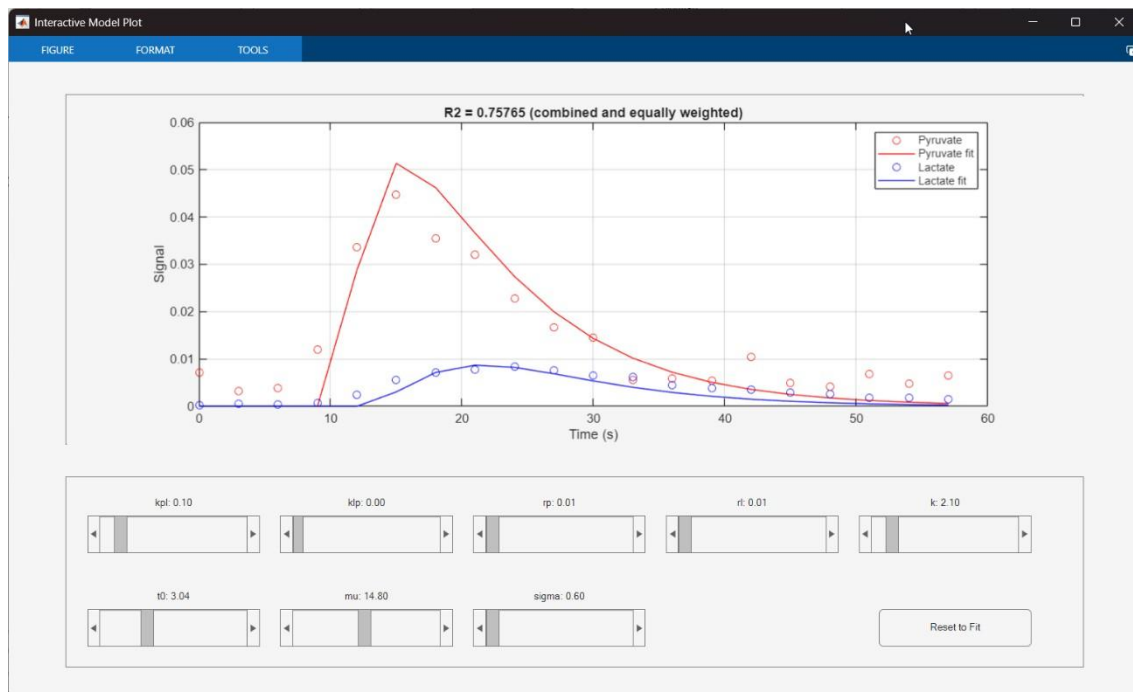
11. The sliders to the right can be used to scale the various maps.



12. The R2 threshold masks the parameter maps based on the Goodness-of-Fit.



13. The Explore Fit button allows for further exploration of a specific voxel to understand the parameters better.



14. Finally the model fit results in a struct can be saved in a file using the Save Fit button.

In the following example, the matrix size of $40 \times 40 \times 2$ (x,y,z) represents the parameter fits of individual voxels in the images.

```
model_fit_results =  
  
    struct with fields:  
  
        par_fits: [40×40×2×8 double]  
        exitflag_fits: [40×40×2 double]  
        kpl_fits: [40×40×2 double]  
        klp_fits: [40×40×2 double]  
        r1p_fits: [40×40×2 double]  
        r1l_fits: [40×40×2 double]  
        k_fits: [40×40×2 double]  
        t0_delay_fits: [40×40×2 double]  
        mu_fits: [40×40×2 double]  
        sigma_fits: [40×40×2 double]  
        R2: [40×40×2 double]  
        pyr_norm: [40×40×2×20 double]  
        lac_norm: [40×40×2×20 double]  
        pyr_fits: [40×40×2×20 double]  
        lac_fits: [40×40×2×20 double]  
        t: [0 3 6 9 12 15 18 21 24 27 30 ... ] (1×20 double)
```