NIRS Toolbox and Epilepsy – to do list

1. In AddStimuli routine,
   1. Generate random (Poisson or uniform or Poisson with time-varying lambda)
   2. Add Volterra nonlinearities to HRF generation process
2. Add a module to extract channels for testing – better: put that in AddStimuli routine
3. Add “wavelet” to Convert OD name, for clarity
4. Code up low pass filter (just Gaussian)
5. Code up module that generate regressors into text files for GLM
6. Testing that the mechanics work
7. The NIRS\_SPM GLM modules
   1. Connect them to each other and to the preprocessing: need GLM model specification files available – but they can be stored in NIRS.mat as usual
   2. Code that creates new stat directory name incrementing from last one seen
   3. Loop over NIRS structures
   4. Connect all the inputs: onsets, regressors
   5. Make contrasts easier to specify and generate
8. Testing the methodology
   1. Test that the nonlinear effect is estimable (for realistic values of parameters)
   2. Compare ROC for methods with or without some of the preprocessing steps (for example, without any preprocessing or with all the preprocessing steps)

Current processing steps:

1. Generate onsets
   1. Permute if required
2. Preprocessing (for testing, add stimuli and extract channels)
   1. Read BOXY data, removing channels more than 6 cm apart
   2. Remove channels based on stdev
   3. Remove channels based on heart rate
   4. Mark negative intensities and interpolate to nearby values
   5. Mark movement jumps and shifts
   6. Normalize to median on segments marked by movement
   7. Convert to concentrations, before or after wavelet detrending?
   8. Low pass filter (Gaussian)
3. GLM
   1. Specification
   2. Estimation
   3. Contrasts
   4. Group level estimation
   5. 2nd level Contrasts?