MyocardiumOnlySimulation.m: This code calls the ODE model ‘dXdT\_myocardium’, which represents one 9-variable myocardium model, using the measured pressures as inputs. (I.e.., this model does not use the epicardial network at all.) It runs relatively fast, and can be used to roughly parameterize the myocardium model.

RestingStateSimulation.m: This code calls the ODE model ‘dXdT\_LAD’, which in turn calls the ODE code ‘dXdT\_LV\_myocardium’. The code dXdT\_LV\_myocardium is very much the same as dXdT\_myocardium, which is the 9-variable ODE representing the 28 lumped parameter outlets to the LAD network. The total number of state variables is explained in the dXdT\_LAD code:

% STATE VARIABLES

% index 1-35: the Voigt body pressure in the segments

% index 36-70: the flow (Q) in the segment

% index 71-322: the 28 9-variable 0-d networks

The network structure is stored in the variables d1, d2, and PARENT, which input from the file ‘LAD network.xls’. The d1(i) and d2(i) are the daughter segments of element i. If d1(i) or d2(i) equal 999, then this indicates a myocardial outlet.

If you run RestingStateSimulations, you get the match of the full model to the resting state data for Pig 2713.

ExerciseSimulation1.m: This script is identical to RestingStateSimulation.m, but uses the exercise data. This script produces the simulation of exercise conditions with no vasoregulation.

ExerciseSimulation2.m: This script is identical to ExerciseSimulation1, with the addition that it uses a vasodilation factor ‘beta1’, that dilates all of the resistance vessels in the myocardium by a common factor.