Quick Start Instructions

gtm_design: Batch Simulation for Design and Analysis

Below are some interactive steps that show trimming, linearizing, and plotting results with the sim.

1. Run the `setup` script from the top-level gtm_design directory. (Since paths are relative the sim should always be run from this directory.) Setup opens the simulation, sets paths, and trims to a nominal condition.

2. Select some output variables for the `SelectOutputs` Bus Selector block located in the top-level model block, including angle-of-attack (*Aux.alpha*).

3. Trim model to 3° angle-of-attack, level fight, and load variable-set (including trimmed inputs) into the Simulink model workspace with the following two Matlab commands:

   ```
   TrimPt=trimgtm(struct('alpha',3.0, 'gamma', 0.0));
   loadmws(TrimPt);
   ```

4. Start the simulation either with the menu *Simulation→Start* or with the command

   ```
   sim('gtm_design',[0 10]);.
   ```

   Plot resulting workspace outputs generated by block NamedStore located in the top level Simulink model block,

   ```
   plot(tout,sout.alpha);
   ```

   The results should be constant.

5. Set angle-of-attack initial condition to 1°, re-simulate and plot response:

   ```
   MWSnew=seteomic(TrimPt,'alpha',1);
   loadmws(MWSnew);
   sim('gtm_design',[0 3]);
   plot(tout,sout.alpha);
   ```

   These results should show the vehicle dynamics for a small perturbation off trim condition.

6. Linearize model about the nominal trim point computed in step 3 and compare freq/damp of longitudinal dynamics to simulated response of step 5.

   ```
   [sys,lonsys,latsys]=linmodel(TrimPt);
   damp(lonsys)
   ```

Most of the simulation functionality is illustrated in example scripts (`example1,example2,...`), these should run (after setup) and produce results that compare to the plots in ./docs/plots/example_plots.pdf