1) **Linear data**.

C:\Users\Malcolm Scott\Documents\MATLAB\bookshelf\different models\3dof\_linear\_dataforce\_input

The folder contains data from a series of tests using a periodic forcing at different frequencies (between 20 and 80), applied at the first floor with the bumper gap set far enough apart that there was no contact. This data is therefore very close to linear.

The data are stored in Matlab structures. Each file contains data from one test at a single frequency, and the name of the file is the value of the forcing frequency.

The force signal gets noisy close to the natural frequencies at around 19 and 51hz.

For each frequency, the acceleration time histories are stored in a matlab structure called “Signal”.

Floor 1 acceleration - Signal.y\_values.values(:,3)

Floor 2 acceleration - Signal.y\_values.values(:,2)

Floor 3 acceleration - Signal.y\_values.values(:,1)

The sampling period (1/sample frequency) and the force time history are stored in a structure called n\_Point1\_\_X.

Sampling period = n\_Point1\_\_X.x\_values.increment

Force - n\_Point1\_\_X.y\_values.values

2) **Nonlinear data**

C:\Users\Malcolm Scott\Documents\MATLAB\bookshelf\different models\bookshelf\_3dof\_nonlinear\_dataforce\_input

The folder contains data from a series of tests using a periodic forcing at different frequencies (between 17 and 80hz), applied at the first floor with the bumper gap set to around 0.5mm. For each set of data the forcing was kept relatively low so the bumper was only just engaging when the frequency was not close to a natural frequency. Subharmonics are seen in the data at around 50-55hz and 65-75hz

The data are stored in Matlab structures as in the previous section.

3)**Amplitude jump data**

C:\Users\Malcolm Scott\Documents\MATLAB\bookshelf\data\jump

This folder contains data showing the system response bifurcating, causing jumps in amplitude close to the natural frequency.

The forcing is periodic, applied at the first floor with the bumper gap set to around 0.5mm.

The files are in pairs i.e. one file shows the data from a periodic forcing and the other shows the data from similar forcing, but the frequency increase by 0.001hz, e.g. the two files named 55.065 and 55.066

4)**Model**

This folder contains the model (filename “bookshelf”) linear parameters (mcmcparamslin) nonlinear parameters (mcmcparams), the parameter distributions (theta, that\_lin) and a script which runs the model using the a measured forcing signal as the input (bksolverSNGL) and plots the modelled outputs alongside the measured ones.

The same model is used for both the linear and nonlinear cases – in the linear parameter vectors the nonlinear stiffness coefficient is set to zero.

To run bksolverSNGL for a particular set of data, change the variable freqi to the name of the data in the first line of code. To run the linear model select “load('mcmcparamslin')” (line 2) or for the nonlinear state select “load('mcmcparams')”