Progress for Week 10:

This week the issue of large uncertainties from last week was addressed. Initially, the exponential of for the m was set to be a trainable parameter. This made almost no improvements to the last uncertainties. Then there was an attempt to model the *Mass vs Rotation* relation with a dense neural network, the neural network was successful in modelling it but didn't offer any advantages to a simple power law. Finally, a bag in the code was identified where the standard deviation was set to be $std = var^2$. The residual plot is shown in Figure 1.

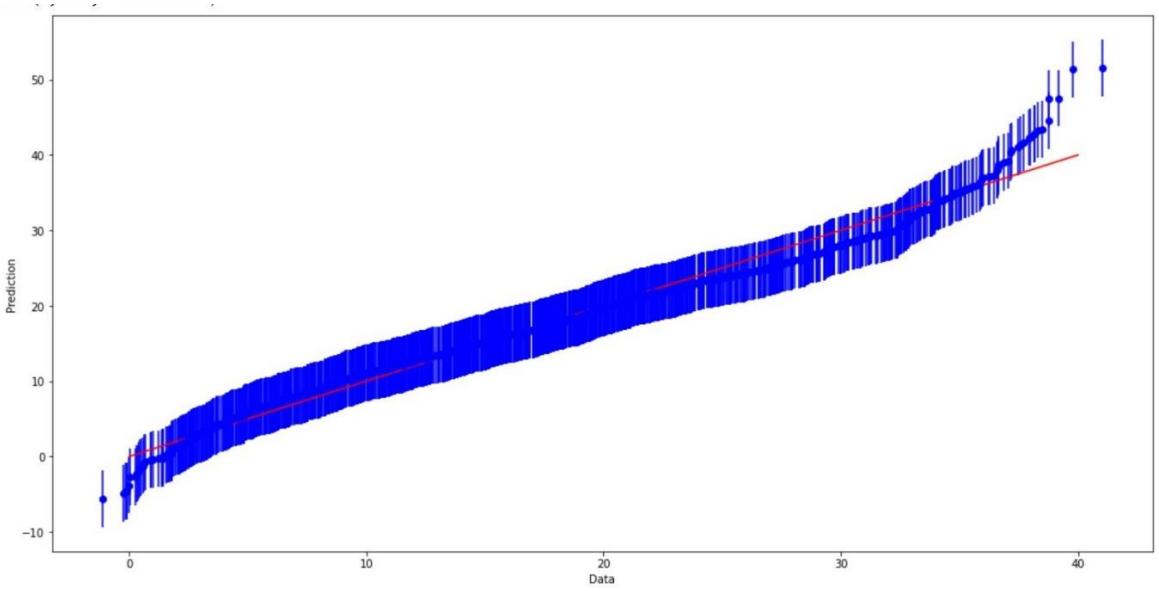
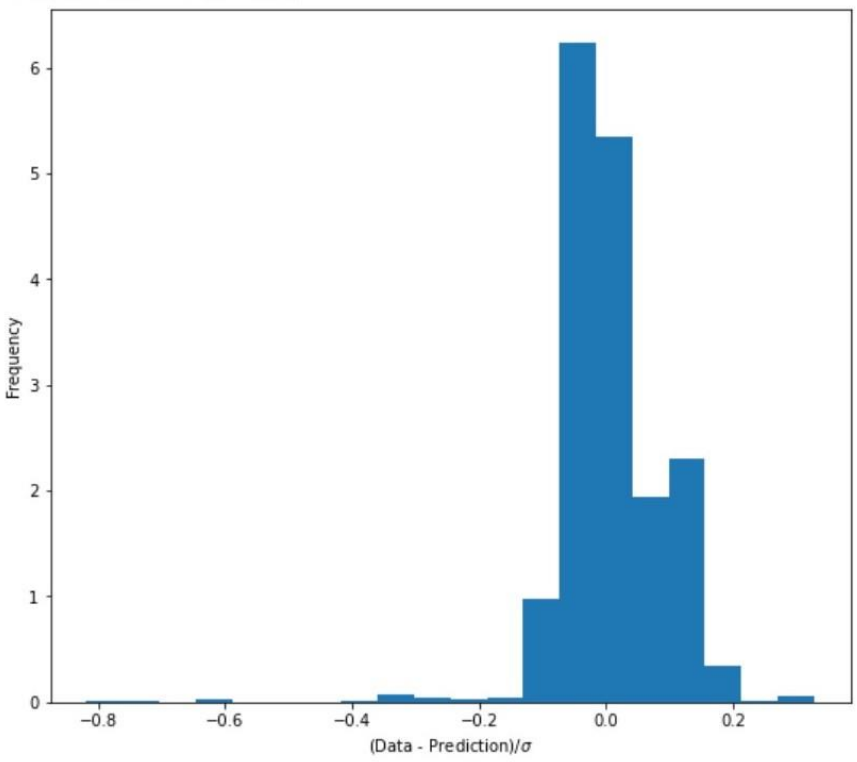


Figure 1: Residual plot for figure 1

Figure 2 shows the z-statistic of the result.



However, the uncertainties in the plot are still larger than expected. An improvement was attempted by trying to predict the logarithm of the rotation period given the logarithm of the mass. This was attempted as the exponential relation would result in a linear relation. However, this was so far unsuccessful but will be pursued further next week.

Finally, an attempt was made to introduce an HMC sampling for the parameters. The acceptance rate was zero which indicates that the HMC never started.

Aims for next week:

- Attempt Log Rotation vs Log Mass GP
- Fix HMC sampling