

3. Small  $\lambda \Rightarrow$  More detailed fit but less smooth curve. Large  $\lambda \Rightarrow$  Smooth curve but less detailed. This is because the smaller  $\lambda$  is, the more details and noises the fit will capture, leading to overfitting sometimes. Whereas larger  $\lambda$  will ignore smaller information, leading to a smoother curve but not as accurate. This can lead to an underfitting. Therefore, a moderate choice of  $\lambda$  is the best, probably around 0.1 to 1. Nothing too much is good, so always moderate and pick the medium of the pack as you know, the medium is premium.
4. The 3 most dominant frequencies are: 0.03998, -0.03998, and 0.07996