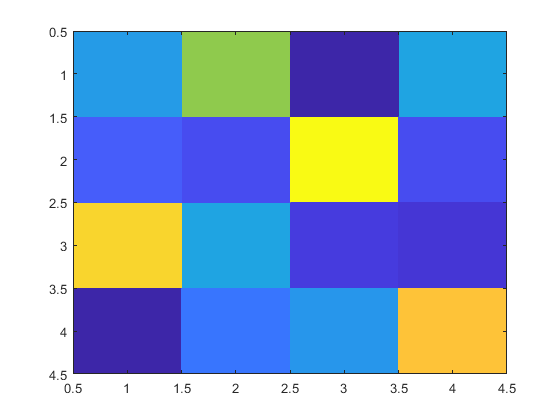
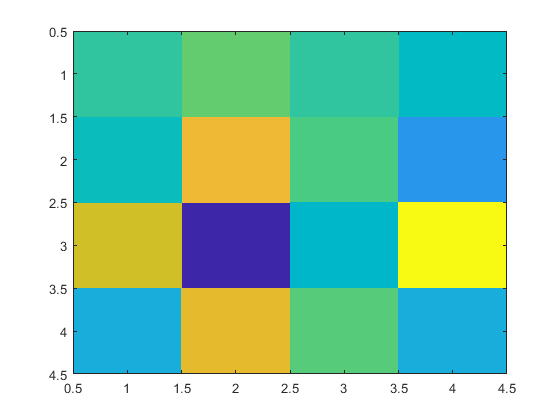
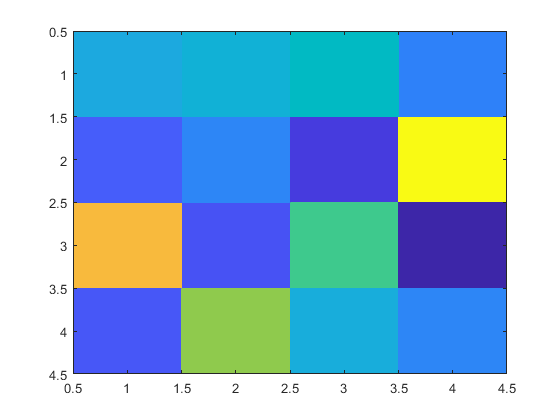
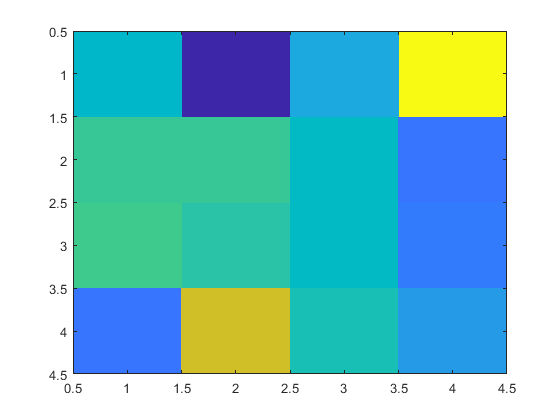
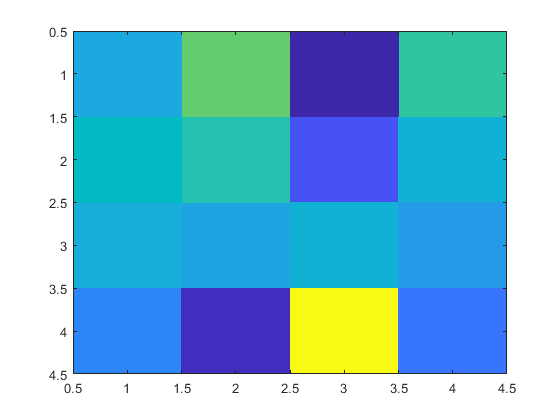
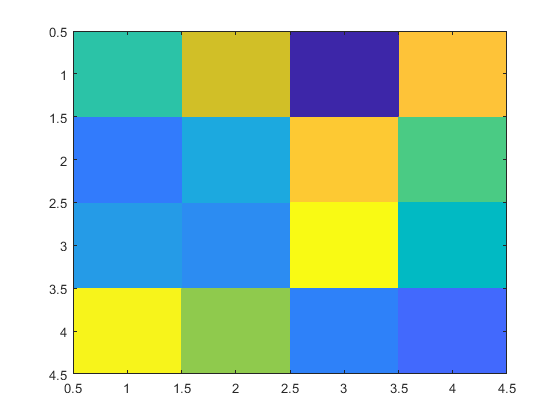
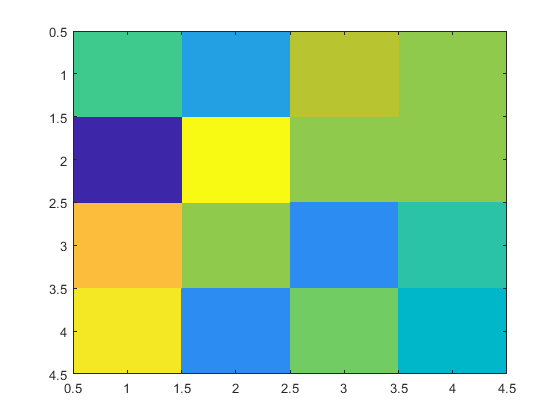
Mike Sosa (mcs348)

EAS 4840

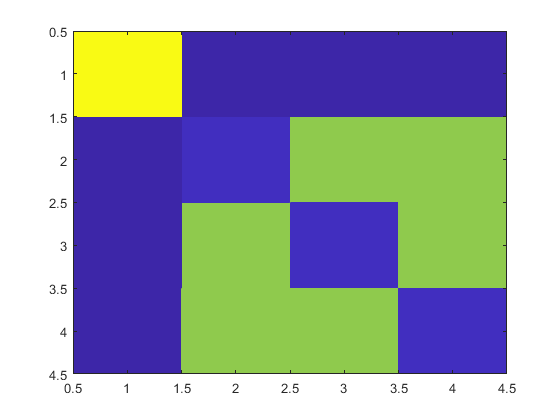
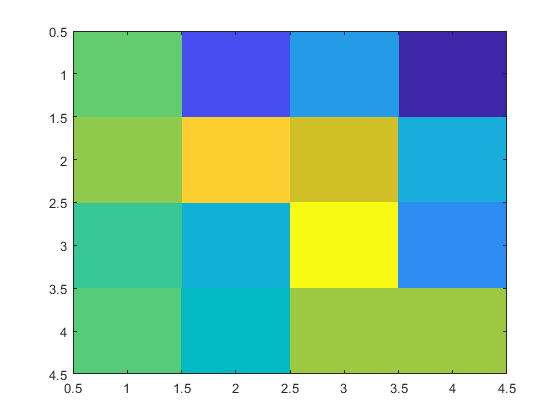
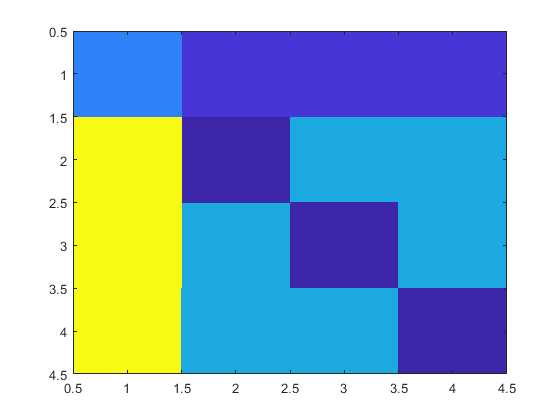
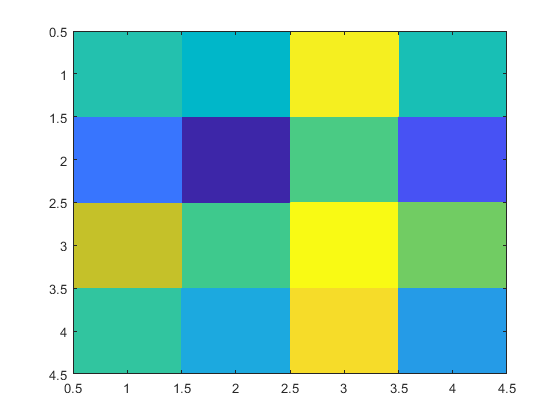
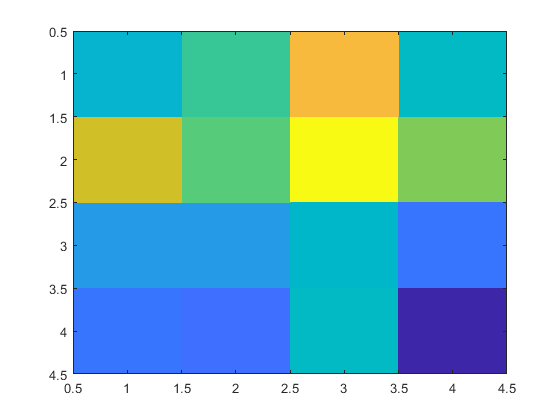
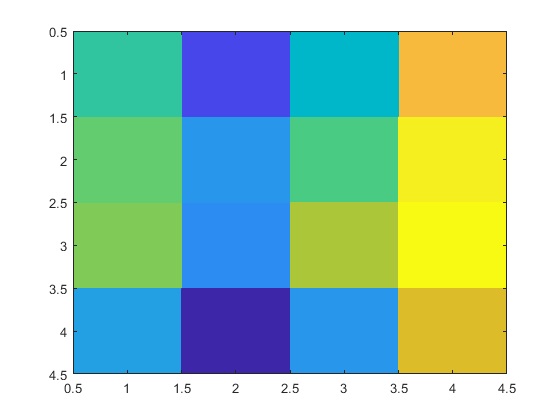
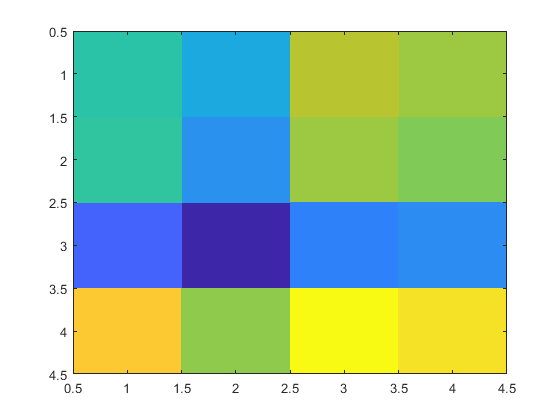
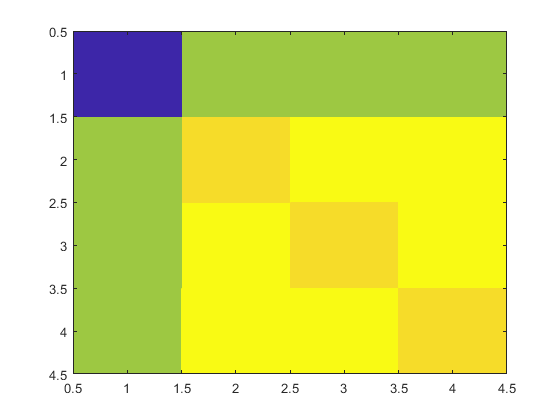
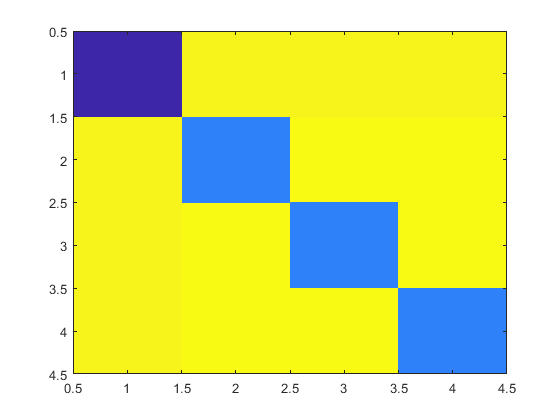
HW 3

Problem 1 (Assuming L = 1, aka block size is unit length)

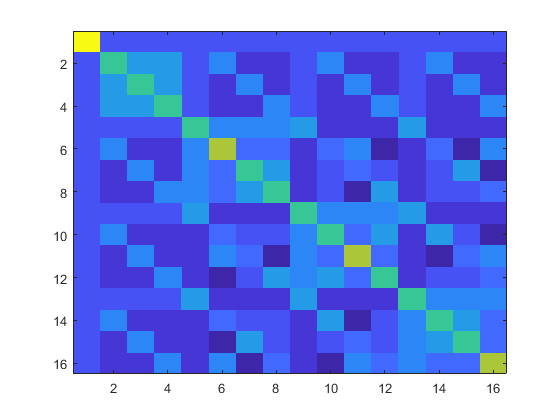
Generated images of model nullspace



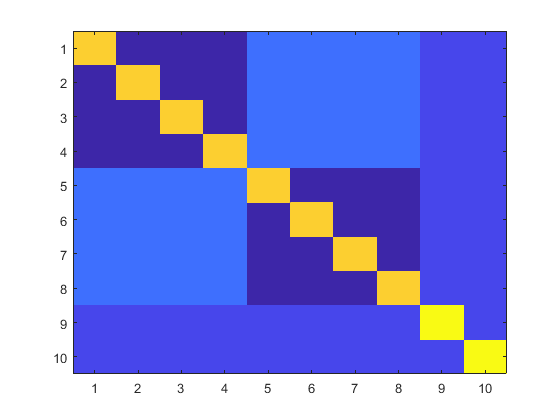
Images of model row space



Model Resolution Matrix



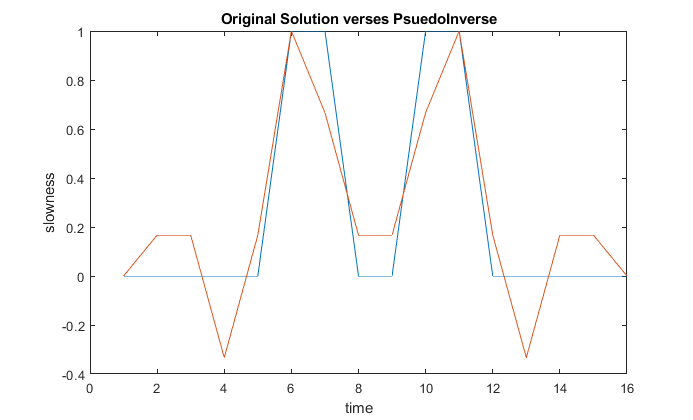
Data Resolution Matrix



If finally performed the noiseless spike test with the following code



Which gave me the following graph



Where the true slowness is seen in blue (with a max of one) and the pseudoinverse solution is seen in orange.

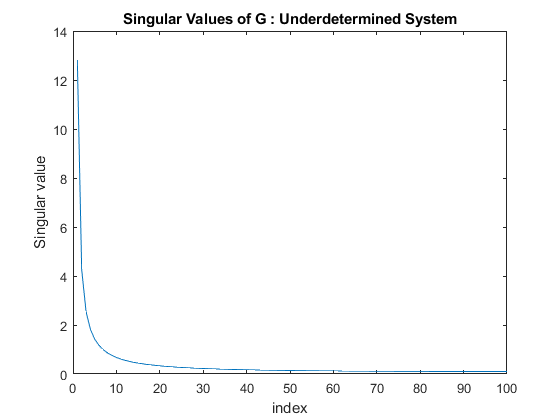
Problem 3

I returned to the VSP problem, this time solving an underdetermined system (n=100, m=400) using the SVD. I used the following code

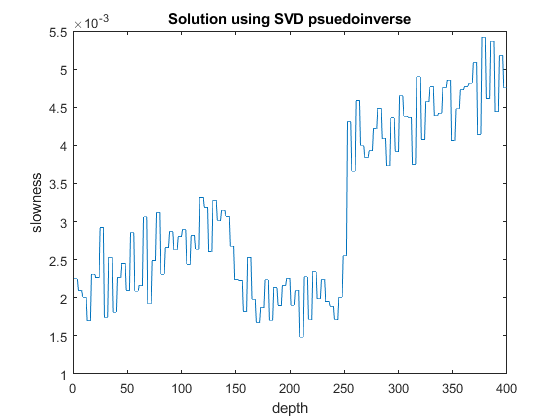




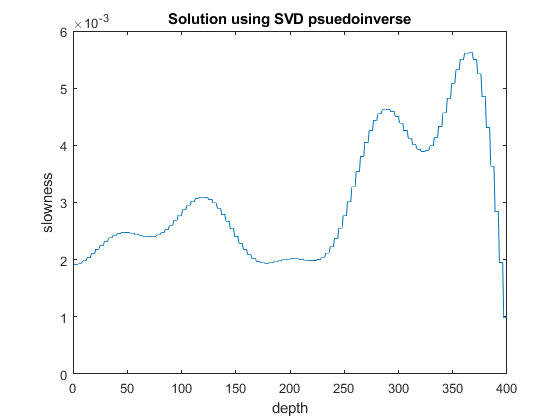
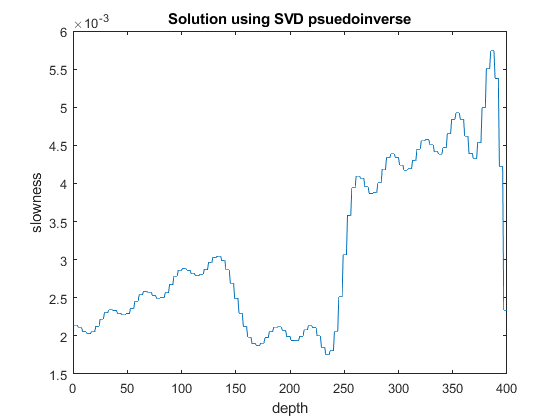
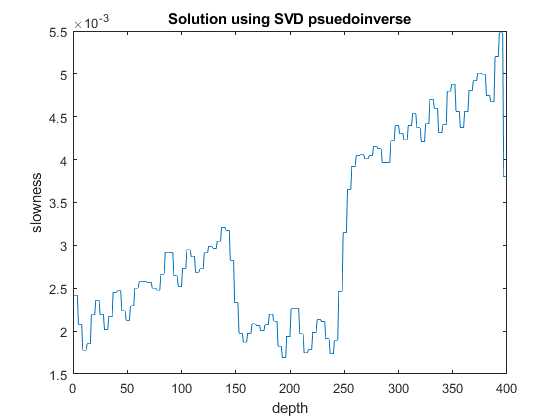
And received the following plot for the singular values.



Solving for the solution with all singular values gave me



Reducing the solution to half, quarter, and tenth of the singular values are shown below.



Using half of the singular values works pretty well, while using a quarter also works to a decent extents. But after throwing out 90% of the singular values, the solution is almost all but lost, except for a vague general shape.