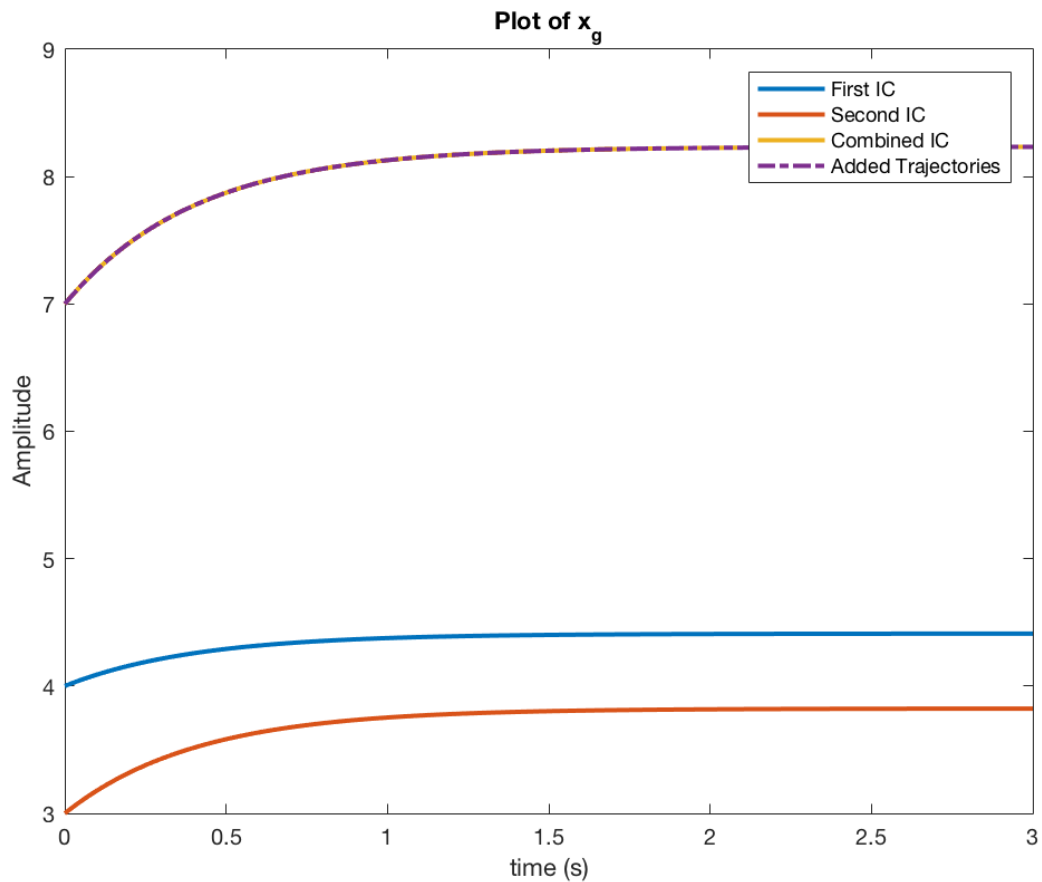
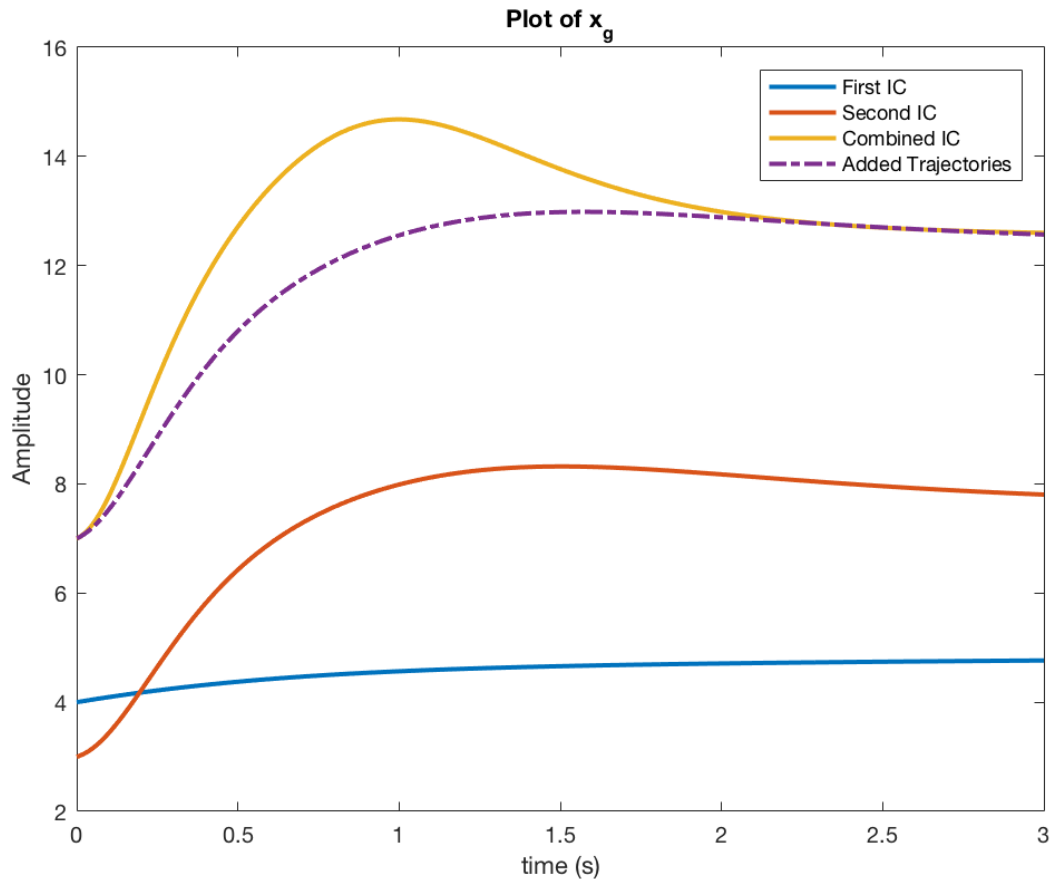


Project linear system

- a. Simulating (L) with first $x(0) = [5, 2, 4, 1]$ and $u = [5, 5]$ and second $x(0) = [7, 1, 3, 2]$ $u = [2, 3]$. Plot shows the trajectories with these initial conditions and then shows the simulation of adding the initial conditions. Finally, the plot shows the first two trajectories added (dashed line). Note the two lines (simulating from added initial conditions and the two added trajectories) coincide.



- b. Simulating (N) with first $x(0) = [5, 2, 4, 1]$ and $u = [5, 5]$ and second $x(0) = [7, 1, 3, 2]$ $u = [2, 3]$. Plot shows the trajectories with these initial conditions and then shows the simulation of adding the initial conditions. Finally, the plot shows the first two trajectories added (dashed line). Note the two lines (simulating from added initial conditions and the two added trajectories) **DO NOT** coincide.



- c. Using the linearized state Matrix A given as:

$$A = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & -10 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & -2.43 \end{bmatrix}$$

the eigenvalues are $\lambda = 0, -10, 0, -2.43$.

System is considered to be **stable**.