LV / SC Coupling

English units

Mass entered in lbm, converted to consistent units: $m = W/386$ [lbf sec^2/in]

Stiffness k [lbf/in], length [in], force [lbf], acceleration [in/sec^2]

$1\,G = 386$ in/sec^2

Metric units

Mass m [kg], stiffness k [N/m], length [m], force [N]

$1\,G = 9.81$ m/sec^2

Primal assembly at the interface

System coordinates $\{g\}$: $\{c_{LV}\} = [L_{LV}]\{g\}$, $\{c_{SC}\} = [L_{SC}]\{g\}$ (SC interface = LV interface)

$[M] = L_{LV}^T M_{LV} L_{LV} + L_{SC}^T M_{SC} L_{SC}$, $[K]$ likewise

Physical responses: $\{x_{LV}\} = [T_{LV}][L_{LV}]\{g\}$, $\{x_{SC}\} = [T_{SC}][L_{SC}]\{g\}$

SC modal mass fraction of mode i: $\phi_i^T L_{SC}^T M_{SC} L_{SC}\, \phi_i$