

List of Tables

2.1	Initial guess from the third order analytical solution around L_1 in the Sun-Earth system	39
2.2	Initial guess from the fourth order analytical solution around L_1 in the Sun-Earth system	39
2.3	Initial guess from the fifth order analytical solution around L_1 in the Sun-Earth system	40
2.4	Initial guess from the third order analytical solution around L_2 in the Sun-Earth system	43
2.5	Initial guess from the fourth order analytical solution around L_2 in the Sun-Earth system	43
2.6	Initial guess from the fifth order analytical solution around L_2 in the Sun-Earth system	43
2.7	The third order solution using Differential Correction method around L_1 in the Sun-Earth system	58
2.8	The Fourth order solution using Differential Correction method around L_1 in the Sun-Earth system	58
2.9	Fifth order solution using Differential Correction method around L_1 in the Sun-Earth system	59
2.10	The third order solution using Differential Correction method around L_2 in the Sun-Earth system	59
2.11	The Fourth order solution using Differential Correction method around L_2 in the Sun-Earth system	60
2.12	Fifth order solution using Differential Correction method around L_2 in the Sun-Earth system	60
2.13	Separation between the third, fourth and fifth order solution around L_1 in the Sun-Earth system	61
2.14	Separation between the third, fourth and fifth order solution around L_2 in the Sun-Earth system	61
2.15	Effect of q_2 on different parameters of orbits around L_1 when $A_1 = A_2 = 0.0002, q_1 = 0.99$	62

2.16	Effect of q_2 on different parameters of orbits around L_2 when $A_1 = A_2 = 0.0002, q_1 = 0.99$	62
2.17	Effect of radiation and oblateness on various parameters of orbits in the Sun-Earth system	63
2.18	Effect of A_1 on different parameters of orbits around L_1 when $A_2 = 0.0002, q_1 = q_2 = 0.99$	64
2.19	Effect of A_1 on different parameters of orbits around L_2 when $A_2 = 0.0002, q_1 = q_2 = 0.99$	64
3.1	Dimensionless parameters of halo orbits around L_1 for different Sun-Planet systems	69
3.2	Dimensionless parameters of halo orbits around L_2 for different Sun-Planet systems	69
3.3	Dimensionless parameters of halo orbits around L_3 for different Sun-Planet systems	70
3.4	Parameters of halo orbits about L_1 and L_2 for Sun-Earth and Sun-Earth+Moon systems	76
4.1	Comparison of states obtained using analytical and differential correction method around L_1 for $q = 1.000$	87
4.2	Comparison of states obtained using analytical and differential correction method around L_1 for $q = 0.995$	87
4.3	Comparison of states obtained using analytical and differential correction method around L_1 for $q = 0.990$	88
4.4	Comparison of states obtained using analytical and differential correction method around L_1 for $q = 0.985$	88
4.5	Comparison of states obtained using analytical and differential correction method around L_2 for $q = 1.000$	89
4.6	Comparison of states obtained using analytical and differential correction method around L_2 for $q = 0.995$	89
4.7	Comparison of states obtained using analytical and differential correction method around L_2 for $q = 0.990$	90
4.8	Comparison of states obtained using analytical and differential correction method around L_2 for $q = 0.985$	90
5.1	Excluded region for $C > C_M$ when $q = 1$	108
5.2	Initial conditions for f -family orbits	110
6.1	Orbital parameters of spacecraft for $C = 2.77$ and $q = 1$	127
6.2	Orbital parameters of spacecraft for $C = 2.77$ and $q = 0.99$	129

6.3	Orbital parameters of spacecraft for $C = 2.77$ and $q = 0.98$	130
6.4	Orbital parameters of spacecraft for $C = 2.8$ and $q = 1$	132
6.5	Orbital parameters of spacecraft for $C = 2.8$ and $q = 0.99$	133
6.6	Orbital parameters of spacecraft for $C = 2.8$ and $q = 0.98$	134
6.7	Orbital parameters of spacecraft for $C = 2.85$ and $q = 1$	135
6.8	Orbital parameters of spacecraft for $C = 2.85$ and $q = 0.99$	136
6.9	Orbital parameters of spacecraft for $C = 2.85$ and $q = 0.98$	138
7.1	Orbital Parameters of resonant orbit for $C = 2.89$ and $q = 1$	144
7.2	Orbital Parameters of resonant orbit for $C = 2.89$ and $q = 0.99$	144
7.3	Orbital Parameters of resonant orbit for $C = 2.89$ and $q = 0.98$	145
7.4	Orbital Parameters of resonant orbits for $e = 0.052$ and $q = 0.99$	149