

# LIST OF FIGURES

Figure 2.1. An orthogonal rotation in two dimensions .....	13
Figure 2.2. An orthogonal rotation in three dimensions .....	14
Figure 2.3. Spacecraft on the orbit .....	16
Figure 2.4. Transformation representation .....	19
Figure 2.5. FDD configuration .....	20
Figure 2.6. Passive control when normal operation (design for $u_2$ outage)	
(a) states (b) input torques .....	29
Figure 2.7. Passive control when $u_1$ fail (design for $u_2$ outage)	
(a) states (b) input torques .....	30
Figure 2.8. Passive control when $u_2$ fail (design for $u_2$ outage)	
(a) states (b) input torques .....	31
Figure 2.9. Passive control when $u_3$ fail (design for $u_2$ outage)	
(a) states (b) input torques .....	32
Figure 2.10. Passive control when $u_4$ fail (design for $u_2$ outage)	
(a) states (b) input torques .....	33
Figure 2.11. Active control when normal operation	
(a) states (b) input torques (c) alarms and residuals .....	34
Figure 2.12. Active control when $u_1$ fail	
(a) states (b) input torques (c) alarms and residuals .....	35
Figure 2.13. Active control when $u_2$ fail	
(a) states (b) input torques (c) alarms and residuals .....	36
Figure 2.14. Active control when $u_3$ fail	
(a) states (b) input torques (c) alarms and residuals .....	37

Figure 2.15. Active control when  $u_4$  fail

(a) states (b) input torques (c) alarms and residuals .....38

# LIST OF TABLES

Table 2.1. Performance of passive control (design for u2 fail) .....	28
Table 2.2. Performances of active control .....	28
Table 3.1. Energy required to transfer stat .....	45
Table 3.2. Distance to uncontrollable .....	50
Table 3.3. Mobility of spacecraft system .....	59