Nonlinear Dynamics and Systems Theory, **6** (4) (2006) 337–342

Stable Communication Topologies of a Formation of Satellites

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Received: July 19, 2005; Revised: September 13, 2006

Abstract: Several currently planned space missions consist of a set of satellites flying in formation. While increasing the functionality, this concept introduces several new challenges with respect to the design of the mission. The topology of the sensing or communication network among the satellites can be a bottleneck in the operation because the transmission of information and the coordination of the formation relies on it. Here we study the robustness of the formation dynamics with respect to changes in the communication topology (like the failure of some communication links). Moreover, we propose a special variant of the notion of stability radius in order to measure the robustness of a certain topology.

Keywords: *Formation; stability; stability radius.*

Mathematics Subject Classification (2000): 70M20, 70K20.