

# Observability Analysis of Two Spacecraft System Using Relative Line of Sight Vector Measurements

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Observability of two spacecraft system is considered with relative line-of-sight vector measurements between two spacecraft system for autonomous navigation using the linear observability analysis. First, the dynamical equations and measurement models are introduced, and the basic assumption of attitude knowledge for one of two spacecrafts is explained. Then, we introduce a pair of nominal orbits of two spacecraft system, and the observability analysis for the nominal orbits is presented with the available measurements (for the numerical observability analysis). Next, the observability analysis with respect to varying orbital elements will be given. The numerical observability is also considered in the nondimensional dynamical system and the orbital element state vector. The relative order of the state variable observability is obtained from the dimensional dynamical system and nondimensional dynamical system.