

Architecture, Specification and reusability of aided Navigation and RendezVous Sensors ASTR SaS (TLS)

Architecture, specification and reusability of aided Navigation and Rendez-Vous sensors NPAL sensor's architecture is a good candidate to illustrate the problematic induced by the aiding between the IMU or the navigation filter on one hand and the sensing part on the other hand. This high frequency loop used on many navigation and rendez-vous sensors creates:

- high communication needs that should be minimized for power, mass and volume optimisation;
- specification/validation problems since the limit between the sensor and the GNC algorithms is blurred by the smart capability introduced in the sensor.

In this scope, we will address:

- Discussion about the architecture of vision based navigation solutions: the use of smart sensor with computation capability is preferred to optimise power, mass and volume.
- Ways to specify algorithms of smart sensors while considering industrial constraints (responsibilities, specifications and interfaces) and validation. Two solutions to specify performances are already foreseen : reference cases definition (an available solution but also a partial solution) and error models. This last solution requires maturing the models as for the star trackers in the last two decades.
- Sensors reusability problem that will lead to building blocs suggestions at sensor level instead of equipment level in order to keep optimised sensors that fit the dynamic and needs of the missions.