SYMPOSIUM ON FUTURE SPACE ASTRONOMY AND SOLAR-SYSTEM SCIENCE MISSIONS (A7)
Science Goals and Drivers for Future Exoplanet, Space Astronomy, Physics, and Outer Solar System Science Missions (2)

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VERIFICATION MISSION OF A SATELLITE TELESCOPE SWARM (ESTS) – ONE CANDIDATE FOR THE NEXT LARGE GERMAN MISSION

Abstract

ESTS (from German: "Erprobungsmission Satelliten-Teleskop-Schwarm") is a candidate for the next German large mission which is defined in a phase 0 study by a team of space industry and institutes lead by the space company OHB System. The scientific partner within the mission analysis is the University of the Federal Armed Forces. Additional support is provided by the German Space Operations Center, GSOC.

The next German large mission shall be selected by the Space Administration of the German Aerospace Center, DLR, within a competitive transparent staged process in parallel phase 0 studies, covering analyses for several mission ideas. Within the selection process the next national large mission will be down-selected in different phases leading to the final selection of the candidate in 2021 and a mission launch 2025/2026.

The final Mission "IRASSI - InfraRed Astronomy Satellite Swarm Interferometr" (for which ESTS shall be the verification mission) is an international space mission to the Lagrange Point L2 with a satellite swarm applying interferometric astronomy within the infra-red spectral band e.g. for characterizing exoplanets. The necessary technology to arrange the swarm constellation with precise distances and geometry is being investigated with the ESTS demonstration mission. Earth observation and astronomy are addressed with the ESTS satellite swarm consisting of three satellites deployed in a low earth orbit. However, emphasis will be put on new technology developments and its application, like frequency combs for precise distance measurements between the satellites as well as the definition of the swarm analog to a geodetic network grid definition, which will be essential for the implementation of the possibly later L2 mission.

The paper describes the results from the phase 0 mission analysis of the demonstration mission ESTS as one interesting candidate for the next large German national mission. In addition a short overview of the other candidates for the next German large mission will be provided.