

Status of the Galileo Solar Space Telescope Mission (GSST) proposal

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**Antunes Vieira, L. E.; Lago, A.; Rockenbach, M.; Guarnieri, F. L.;
Da Silva, L. A.; Carlesso, F.; Alves, L. R.; Souza, V. M. C. E. S.; Jauer, P. R.**

The Galileo Solar Space Telescope (GSST) is a cornerstone mission to provide accurate measurements of the magnetic field in the photosphere and outer layers of the solar atmosphere to be proposed to the Brazilian Space Agency (AEB) within the international effort to understand of the evolution of the Heliosphere. The solar electromagnetic and corpuscular emissions are strongly modulated by the evolution of the magnetic structure of the solar atmosphere. The solar magnetism is driven by the energy transport from the inner layers of the Sun to its atmosphere. Although systematic observations since the invention of the telescope have revealed several features related to the evolution of solar activity, there is not a complete explanation of the physical processes that lead to solar activity cyclic variability and its long-term changes. Here we describe the status of the proposal submitted to the INPE's Steering Committee. The underlying basic questions to be addressed by the GSST mission are: What are the fundamental physical/plasma processes at work in the Sun? How does the solar dynamo work? What is the relative contribution of different physical processes that lead to the heating of the outer layers (Chromosphere to Corona)? What are the effects of the magnetic structure of the outer layers of the Sun on the evolution of the Earth's highly coupled atmosphere-ocean system? What is the response of the magnetic field and energetic particles in the vicinity of our planet, i.e. the Earth's inner magnetosphere region, due to different solar wind structures? Taking into account these open scientific questions, the Galileo Solar Space Telescope proposed mission is to perform solar observations in high spatial and temporal resolution to characterize the evolution of the magnetic structure of the photosphere, chromosphere, transition region, and corona and its impact on the Geospace. Specifically, the mission has three main objectives: (1) Contribute to the understanding of the evolution of the magnetic structure of the Sun; (2) Contribute to the understanding of the Sun's influence on Earth's Climate; and, (3) Contribute to the understanding of the Sun's impact on the Geospace.

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