Project Details

ROSES ID: NRA-01-OSS-01
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Project Title:
Measurement of Electromagnetic Fields via Flight Times from Spread-Beam Electron Sources

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Summary:
We propose to develop and evaluate a new concept of electron-drift instrument that relies solely on time-of-flight measurements from multiple spread electron beams to extract measurements of ambient electromagnetic fields. We expect such an instrument to be applicable to many missions, but in particular to be ideally-targeted to the task of monitoring and/or mapping key parameters of geospace disturbances from spacebound platforms with high time resolution, low influence from spacecraft disturbances in the ambient environment, and low demands on spacecraft resources. We envision a two-phase process in the evolution of this new instrument. In this first phase, we will develop a design concept with reduced demands on both spacecraft resources and maturity of component technologies, to provide the basis of an instrument definition for future missions aligned with LWS objectives. We will define and evaluate key components of this design and will undertake a comprehensive examination of its capabilities and limitations for a number of conceivable mission configurations, objectives and environments. A future phase of development of this instrument (enabled by emerging higher-speed sensor technologies and modestly increased demands on spacecraft resources) will fulfill the promise of full-vector measurements of electromagnetic fields and gradients at even higher resolution in time, magnitude and direction.

Publication References:

no references