Next Generation EUV/Soft-X-ray Mission

[Draft - 07/25/11]

Name of Technology (256 char)	extended duration rockets	EUV or Soft X-ray detector systems	Gratings
Brief description of the technology (1024)	Modest launch vehicles capable of putting a few hundred kg in orbit for a few weeks, but also supportive of the objective of converting existing sounding rocket payloads into short-life satellites.	Existing EUV detectors suffer from low quantum efficiency which must be compensated by long observing time. Improved photocathodes and electronics improvements can be multipliers for system performance numbers	High-resolution blazed gratings for high power, replicated by emerging nanolayer technologies. This capability delivers high spectral resolution to analyze source spectral lines and separate them from spectral features of the interstellar medium.
Goals and Objectives (1024)	The goal is to reach flight readiness around 2015	The goal is to reach TRL 6 by 2015	The goal is to reach TRL 6 by 2015
TRL	Suitable vehicles have been tested a few times, hence have TRL 9. Satellite systems to match have not been developed	4 TRL is between 4 and 5. Requires efforts towards space qualification and testing in relevant environment.	TRL is 2 for new designs. Prototyping for new concepts has only begun
Tipping Point (100 words or less)	A single demonstration flight, such as was done for the SPARTAN concept in the 1980s would bring the concept to maturity	Pixel designs require custom ASIC development to meet targets for power combined with noise level.	Prototypes exist involving nano-fabrication using high-Z materials to deliver performance at higher energies.
NASA capabilities (100 words)	NASA's capabilities at WFF are central to this concept. There is no realistic alternative but DoD may be able to contribute constructively.	NASA's does not have an engineering group producing detectors of this kind but suitable commercial sources exist	N ASA has no appropriate facilities but they also exist in other government departments and in industry.
Benefit/Ranking	Ranking iv. The benefit of a short orbital mission over a sounding rocket flight is roughly the ratio of the durations, i.e., 10^6.5 s / 10^2.5 s, or 10^4.	The detector unit is crucial for envisioned next-generation systems. Ranking iv.	Gratings and multilayer coatings are essential for normal incidence spectrometers. Fabrication technologies for both are applicable at X-ray and UV wavelengths. Ranking iv.
NASA needs/Ranking	Ranking iv. Mission capability intermediate between sounding rockets and explorers enables a strategy for maintaining the astrophysics community and training students in a time of lean budgets	The detectors that support EUV can with modifications be used on optical/NUV missions planned for later years. Ranking: iv	Gratings remain the preferred way to reach high spectral resolution at these energies ranking iv.

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Non-NASA but aerospace needs	There is synergy with DoD use of similar LV and satellite systems, creating potential for partnershiops	potential remote sensing applications	potential remote sensing applications
Non aerospace needs	Not applicable, by definition	Can be used in synchrotron and laser plasma research	Can be used in synchrotron and laser plasma research
Technical Risk	Technical risk is low; development paths are straightforward	Technical risk is low but there is some risk of backsliding in the industrial capabilities. Ranking ii	Technical risk is moderate for completely new approach.
Sequencing/Timing	Needed immediately to establish programmatic viability	Should come as early as possible. Development of other system components depends on it. Ranking iv	Essential to development of explorer class mission
Time and Effort to achieve goal	Ranking iii. Moderate effort. 3 year collaboration between industry and NASA	Ranking iv. Minimal effort. 3 year collaboration between industry and NASA	Ranking iv.Minimal effort. 3 year collaboration between industry and NASA