

**Amendment Number 0003
Questions and Answers**

Broad Agency Announcement (BAA) 09-027

Affordable Modular Panoramic Photonics Mast

The purpose of this amendment is to answer questions received in response to the BAA. This amendment makes no changes to the time and date for which proposals are due.

Q1. Product 4) SWIR Hyperspectral Sensor: The hyperspectral imager is to interface with the "existing" mast optics, that are f/6. Is that true?

A1. The optics do not currently exist. It is expected that optics will be delivered as part of the sensor.

Q2. If it is true, what is the size of the image plane (in angle, and mm)?

A2. These are left to the discretion of the provider in a manner that is consistent with the goals stated in the BAA.

Q3. The hyperspectral imager is to cover a vertical field of view of 15 degrees (-5 to +10) what is it to cover horizontally?

A3. For a scanned slit type sensor the goal is to cover the full 360 degree horizon. For a staring type sensor that could operate in a step stare mode to cover the same area, the horizontal field of view and horizontal pixel count should provide resolution that is similar to that achieved in the vertical direction.

Q4. The spatial dimension of the hyperspectral imager is 1280. Is that total pixels (roughly 36 x 36), or vertical pixels?

A4. It is a linear number of vertical pixels, not an area.

Q5. If it is vertical pixels what is the horizontal pixel count?

A5. See the response to question 3 above.

Q6. The frame rate of the hyperspectral imager is given as 100 hz. Is that 100 data-cubes/second? Or is that 1280 spatial by 512 spectral slices of the data-cube per second?

A6. It is 1280 spatial by 512 spectral slices per .01 secs.

Q7. The noise floor specification is given as $< 2.5 \times 10^9$ photons/sec-cm². At which wavelength is this required, and what is the bin width in wavelength?

A7. The noise specification is at the focal plane at all wavelengths covering the spectral band of the instrument.

Q8. The bins are to be 15nm wide, so there are 11 pixels per bin in order to use the 512 pixels. Are solutions that use less pixels per bin, 2 for example, acceptable?

A8. The 15nm number should not be construed to be a bin size, but rather the worst case spectral resolution required for the instrument. In this case the bin width should be thought of as the instrument spectral width divided by the number of spectral channels. Binning of multiple spectral channels to achieve the desired signal to noise ratio at the worst case resolution is acceptable.

Q9. The hyperspectral specification is confusing, by this specification do you intend to use a slit spectrometer with a 2D FPA and scan the slit by rotating the mast? If this is what you desire are you requesting a proposal for the build of the slit spectrometer coupled to a SWIR band FPA that is 1280 x 512?

A9. The specification was written with the assumption that a scanned slit type system with a 1280x512 focal plane would be provided. Other approaches that were shown to provide equivalent capability would be considered on an equal basis.

Q10. On page 5 of the BAA, the required NEI is given as $2.5E8$ ph/cm²-s. We would like to know under what background flux and integration time the NEI is specified.

A10. The NEI value is for a background flux incident on the focal plane of $6 \cdot 10^8$ photons/sec-cm² and the integration time is 0.033 sec.
