

Mississippi State University
Notice of Proposed Sole Source Purchase

267-040

Mississippi State University anticipates purchasing the item(s) listed below as a sole source purchase. Anyone objecting to this purchase shall follow the procedures outlined below.

1. Commodity or commodities to be purchased (make, model, description):
 - Gen II Capacitively Coupled Anode Large Area Picosecond Photo Detector (LAPPD) (408-7046-A)
 - 220 mm Square Photodetector with 229 x 220mm
 - Rectangular anode base, 229 x 220x 21.8mm(9.02 x 8.66 x 0.86")
 - Device consists of:
 - Chevron pair of 203 mm × 203 mm ALD-GCAMCPs with with 20 μ m pores and 25 μ m pitch
 - Top window with deposited photocathode with area of 400 cm^2
 - Independent control of voltage to the photocathode and MCPs
 - LAPPD is mounted on a pixelated signal board with SMA connectors, and housed in an Ultem insulating frame (300 x 274 x 26.8mm) for easy connection and protection
 - LAPPD targets the following specifications:
 - Gain $\geq 5E6$
 - Quantum Efficiency $\geq 20\%$
 - High temporal resolution (< 100 psec)
 - Spatial resolution (< 3 mm)
 - Pulse Rise time (0.75 nsec)
 - Transportation Cases
 - For secure transport doing shipping
 - Engineering Support
 - Covers engineering support to design modifications to photosensor PCB layout for signal output.

2. Explanation of the need to be fulfilled by this item(s), how is it unique from all other options, and why it is the only one that can meet the specific needs of the department:

The LAPPD described above is a specialized component required for the development of an advanced neutron radiation tracking system. Three LAPPDs will be optically coupled to three orthogonal faces of a large cubic organic glass scintillator (OGS). The OGS has a very fast scintillation response, producing light pulses on nanosecond timescales following interactions with neutrons or gamma-ray photons.

Neutron and gamma-ray interactions within the OGS produce scintillation pulses with different temporal characteristics. Measurement of these differences enables neutron/gamma discrimination; however, doing so requires a photosensor with exceptional temporal resolution. In addition, a primary objective of this project is to determine the location of neutron interactions within the OGS volume. The photosensors must therefore provide both precise timing and spatial information for detected scintillation light.

LAPPDs uniquely satisfy these combined requirements by providing sub-100-picosecond temporal resolution together with position-sensitive photon detection. These capabilities are necessary to resolve the nanosecond-scale scintillation processes within the OGS and provide the spatial and temporal information required for neutron interaction localization and tracking. Accordingly, both the high temporal resolution and position-sensitive detection capabilities of the LAPPD are essential technical requirements for the proposed neutron tracking system.

Due to the custom nature of this application, direct engineering support from the LAPPD manufacturer is also required. Integration of the LAPPDs with the custom OGS detector assembly will require technical guidance regarding optical coupling, mechanical integration, electrical interfaces, signal readout, and detector operation. Access to engineers with detailed knowledge of the LAPPD design and performance is therefore necessary to ensure successful integration and operation of the neutron tracking system.

3. Name of company/individual selling the item and why that source is the only possible source that can provide the required item(s):

Incom, Inc. – They are the only manufacturer of photosensors with position sensitivity and temporal resolution below 100 picoseconds.

4. Estimated cost of item(s) and an explanation why the amount to be expended is considered reasonable:

LAPPDs - \$43,440 Each, Quantity 3, total of \$130,320

Transportation Case - \$495.00, Quantity 3, total of \$1,485

Manufacturing Engineering - \$17,500, Quantity 1, total of \$17,500

Grand Total: \$149,305

5. Explanation of the efforts taken by the department to determine this is the only source and the efforts used to obtain the best possible price:

Incom, Inc. is the only manufacturer constructing LAPPDs. The LAPPDs used in this application are custom made to meet project objectives.

Any person or entity that objects and proposes that the commodity listed is not sole source and can be provided by another person or entity shall submit a written notice to:

Jennifer Mayfield, CPPO

Director of Procurement Services, Chief Procurement Officer

jmayfield@procurement.msstate.edu

Subject Line must read "Sole Source Objection"

The notice shall contain a detailed explanation of why the commodity is not a sole source procurement. Appropriate documentation shall also be submitted if applicable.

If after a review of the submitted notice and documents, MSU determines that the commodity in the proposed sole source request can be provided by another person or entity, then MSU will withdraw the sole source request publication from the procurement portal website and submit the procurement of the commodity to an advertised competitive bid or selection process.

If MSU determines after review that there is only one (1) source for the required commodity, then MSU will appeal to the Public Procurement Review Board. MSU will have the burden of proving that the commodity is only provided by one (1) source.

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