



**JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION**  
**FAR 13.501**

Far-Infrared Dual Frequency Comb System  
Purchase Request: NB675020-23-00958

**1. Agency Contracting Activity.**

Department of Commerce  
National Institute of Standard and Technology (NIST)  
Office of Acquisition and Agreements Management (OAAM)  
Acquisition Management Division (AMD)  
325 Broadway  
Boulder, CO 80305

**2. Nature and/or Description of the action being approved.**

NIST/OAAM/AMD, on behalf of the Fiber Sources and Applications Group (FSAG), Spectrum Technology and Research Division 675, intends to negotiate on a sole source basis with IPG Photonics Corporation, of Oxford, Massachusetts, to procure a far-infrared dual frequency comb system. This requirement will be fulfilled using Simplified Acquisition Procedures under the authority of FAR 13.5 Simplified Procedures for Certain Commercial Items. The justification herein was developed utilizing the format requirements identified in FAR 6.303-2, modified to reflect that the procedures in FAR Subpart 13.5, in accordance with 41 U.S.C. 1901.

**3. Description of the supplies or services required to meet the agency's needs (including the estimated value).**

The FSAG has been pursuing a novel form of spectroscopy, dual-comb spectroscopy, for several years. This technique can support measurements of greenhouse gases as well as many other atmospheric gases related to air quality and climate change. However, thus far efforts have been limited to the near infrared (1-2 micrometers in wavelength) and the mid-infrared (3-5 micrometers). The far infrared spectral region covering from beyond 5 micrometers out to 20 micrometers would allow detection of a much wider range of atmospheric gases which could improve our scientific understanding of both climate change and air quality. To this end, the group requires a coherent dual-frequency comb system that operates in the far infrared spectral region, with sufficient optical coherence for high signal-to-noise ratio measurements, and sufficient optical power to make measurements over long free-space air paths.

The estimated total cost of this requirement is [REDACTED] to include delivery of the system, tool start up demonstration, training, and minimum one-year warranty from date of acceptance.

**4. Statutory authority permitting other than full and open competition.**

Statutory authority for sole source is 41 U.S.C. 3304(a)(1), Only one responsible source with no distributors. The statute is being implemented using simplified acquisition procedures under the authority of 41 U.S.C. 1901.

**5. A demonstration that the proposed contractor's unique qualifications or the nature of the acquisition require use of the authority cited.**

IPG Photonics Corporation has developed a commercial far-infrared dual comb system that is based on rack mounted pump lasers and can produce significant optical power, which is required for open path measurements, and is coherent which is required for the dual-comb spectroscopy technique. The IPG Photonics Corporation far-infrared dual-comb system meets the necessary requirements for future open path dual-comb spectroscopic measurements of atmospheric gases. Other dual frequency comb systems are available from several companies but not with the wavelength coverage in the far-infrared or the power output.

**6. A description of efforts made to ensure that offers are solicited from as many potential sources as is practicable, including whether a notice was or will be publicized as required by Subpart 5.2 and, if not, which exception under 5.202 applies.**

A sources sought notice was posted to SAM.gov on 2/7/2023, with a closing date of 2/15/2023. One response was received, but ultimately was determined to be unable to meet the technical specifications. As a result, in accordance with FAR 5.203 and 41 U.S.C. 1901(e)(1), a Notice of Intent (NOI) to sole source was posted to SAM.gov stating the intent to enter into a sole source procurement with IPG Photonics Corporation. The notice was posted on 3/8/2023, with a response date of 3/23/2023, with the notice stating all responsible sources interested may identify their interest and capability. On the closing date no responses were received.

**7. A determination by the contracting officer that the anticipated cost to the government will be fair and reasonable.**

The Contracting Officer (CO) will determine that the anticipated price is fair and reasonable in accordance with FAR 13.106-3(a)(2)(ii) and (iv) – comparison of the proposed price with prices found reasonable on similar previous purchases and comparison to the independent government estimate. Prior to award of the proposed contract, the proposed price will be evaluated. The evaluation will determine whether the proposed prices are reasonable in relation to the solicitation requirements. Prices must be entirely compatible with the technical portion of the quotation. The CO has determined that the anticipated costs to the Government will be fair and reasonable based on evaluation of commercial pricing, comparison to previous purchases, and comparison to the Government estimate.

**8. A description of the market research conducted (see part 10), and the results or statement of the reason market research was not conducted.**

Market research was conducted to identify available sources and to evaluate the availability of the marketplace to meet the requirement as follows:

- a. The technical point of contact spoke with colleagues knowledgeable in the field of study, performed internet searches, and relied on their professional expertise to identify potential sources for the required system, including Vescent Photonics, Menlo Systems, and IPG Photonics Corporation. After communications and review of products offerings from these companies, only IPG Photonics Corporation was found to produce a system that can meet all the technical specifications. Additionally, the contracting officer identified two potential sources, Daylight Solutions, Inc. and Toptica Photonics, based on past government purchases of similar laser type equipment.
- b. A sources sought notice was posted to SAM.gov on 2/7/2023, with a closing date of 2/15/2023. A courtesy email of the sources sought notice was sent to all companies identified during market

research. One response was received from Toptica Photonics which included an initial detail of the technical specifications of their offering to the requirement. This was sent to the Technical Point of Contact, Kevin Cossel, who identified a technical specification which fell below the required threshold, specifically item [REDACTED] of the government technical specifications. This deficiency was identified to Toptica Photonics who ultimately indicated they would not be able to meet the required specification.

**9. Any other facts supporting the use of other than full and open competition.**

None

**10. A list of sources, if any, that expressed in writing, any interest in the acquisition.**

IPG Photonics Corporation, Toptica Photonics.

**11. A statement of the action, if any, the agency make / take to remove or overcome any barriers to competition before any subsequent acquisition for the supplies or services required.**

The Government will continue to conduct thorough market research to gauge the marketplace capabilities for future requirements. During the expected life cycle of this equipment, NIST will work to identify additional products that could meet its requirements.

**Certification**

**Requisitioner:**

I certify that the facts and representations under my cognizance, which are included in this justification, and which form a basis for this justification, are complete and accurate.

KEVIN  
COSSEL



Digitally signed by KEVIN  
COSSEL  
Date: 2023.04.19  
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Kevin Cossel  
Technical Point of Contact

**Contracting Officer:**

I certify that this justification is accurate and complete to the best of my knowledge and belief.

DANIEL  
KENT



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DANIEL KENT  
Date: 2023.04.20  
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Daniel Kent