Italy-Florence: Astronomical and optical instruments
2023/S 151-482130

Prior information notice

This notice is for prior information only

Supplies

Legal Basis:
Directive 2014/24/EU

Section I: Contracting authority

I.1) **Name and addresses**

Official name: INAF Osservatorio Astrofisico di Arcetri
Postal address: Largo Enrico Fermi 5
Town: Firenze
NUTS code: IT Italia
Postal code: 50125
Country: Italy
Contact person: MARCO BONAGLIA
E-mail: marco.bonaglia@inaf.it
Internet address(es):
Main address: https://www.arcetri.inaf.it/en/
Address of the buyer profile: http://wwwmorfeo.oabo.inaf.it/

I.3) **Communication**

The procurement documents are available for unrestricted and full direct access, free of charge, at: http://wwwmorfeo.oabo.inaf.it/index.php/infolor/
Additional information can be obtained from the abovementioned address

I.4) **Type of the contracting authority**

Other type: Research Institute

I.5) **Main activity**

Other activity: Research

Section II: Object

II.1) **Scope of the procurement**

II.1.1) **Title:**

Preliminary Information Note for MORFEO LOR WFS Acquisition Stages' procurement

II.1.2) **Main CPV code**

38630000 Astronomical and optical instruments

II.1.3) **Type of contract**

Supplies

II.1.4) **Short description:**

ELT is the world's largest optical-infrared telescope (39m diameter) under construction by ESO (https://elt.eso.org/) . ELT is considered worldwide to be one of the highest priorities in ground based astronomy.

MORFEO (http://wwwmaory.oabo.inaf.it/), will help compensate for the distortion of light caused by turbulence in the Earth's atmosphere. MORFEO is a Multi-Conjugate Adaptive Optics module that will allow spatially uniform adaptive optics compensation over a large field of view (about 1 arcmin2) with high sky coverage.
The LOR WFS Module is a subsystem of MORFEO dedicated to sense the atmospheric turbulence through the usage of Natural Guide Stars (NGS). The call will cover the final design and the manufacturing phases of dual axes orthogonal linear stages able to displace the LOR WFS across the instrument technical field to allow NGS acquisition. The manufacturing phase includes the assembly, integration and verification at the company premises and the delivery to INAF-Arcetri.

II.1.5) **Estimated total value**

II.1.6) **Information about lots**

This contract is divided into lots: no

II.2) **Description**

II.2.3) **Place of performance**

NUTS code: ITI14 Firenze

Main site or place of performance:

The LOR WFS Acquisition Stages must be delivered to the INAF - Arcetri Observatory in Firenze (L.go E. Fermi 5, Firenze, Italy).

II.2.4) **Description of the procurement:**

The call will cover the procurement of the LOR WFS Acquisition Stages needed by MORFEO and it will cover the final design phase for the stages plus the manufacturing phase (depending on the successful achievement of the project's final design phase) which include the assembly, integration, and verification at the company premises and the delivery and commissioning at the INAF - Arcetri Observatory integration hall in Europe (Firenze, Italy). The transition between the final design phase and the manufacturing phase will be subjected

to internal and external constraints (technical verification and acceptance of the Final Design by MORFEO Consortium and ESO.
Assuming as T0 the date of the Kick Off Meeting with the selected contractor, the Final Design Phase shall end within 12 months from T0 while the delivery of the stages (if the manufacturing is approved) at the INAF - Arcetri Observatory Integration Hall shall take place within 33 (thirty-three) months from T0.
All the ESO standards for ELT instrumentation will be applied to the projects
Mechanics:
Travel range: X: ± 300 mm, Y: ± 150 mm
Payload: > 55 kg
Mass of the stages assembly: < 200 kg (cables and control electronics are excluded)
Maximum volume of the stages: 1200 x 1100 x 180 mm (X x Y x Z, where Z is the direction of the gravity vector, pushing the payload against the stages assembly)
Overall accuracy (linear per axis): < 5 µm over the full travel range
Overall accuracy (pitch and yaw): < 20 arcsec over the full travel range
Bidirectional repeatability (linear per axis): ±0.5 µm
Bidirectional repeatability (pitch and yaw): ±1.0 arcsec
Holding force per axis: when the motor is off each axis has to survive to an earthquake event so that the payload undergo negligible motion when accelerations of ax= ± 3.300 g, ay= ± 3.300 g, az= ± 2.185 g are applied
Electronics:
Linear absolute encoders shall be present on both axes
Dual limit switches shall be present on both axes and must be used with 24V logic
Park switches shall be present on both axes.
In the Y axis the park switch shall be positioned within 5 mm from the negative limit switch.
In the X axis the park switch should be swappable between positive and negative limit switches (within a 5 mm distance).
The control electronics for the Acquisition stages must be based on EtherCAT standard drives such as the Beckhoff EL7211-0010 (or similar) or the ELMO G-DCWHI15/100EE (or similar).
The control electronics must make use of the following items:
Connectors: M-series of circular connectors with crimped pins/terminals (solder pins are not allowed).
Cables: Flame retardant wires and cables according to IEC 60332-1 and IEC 60332-3.
The electrical drawings must comply with the following standards:
EN 62027: Preparation of object lists, including parts lists
IEC 81346: Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations
EN 61082-1 Preparation of documents used in electrotechnology
The schematic shall be produced with a dedicated electrical schematic CAD system. Only CAD systems producing professional schematics with support of auto-generation of cable lists, PLC signal lists, terminal lists, etc. shall be used (e.g. EPLAN, Aucotec, See-electrical or similar)
RAMS
The stages shall have an MTBF higher than 10000 h
Chile operative conditions: Temperature 0 to 15° (low risk of condensation)
Europe operative conditions: Temperature 0 to 23° (high risk of condensation)
QTY
Three complete assemblies of Acquisition Stages provided with control electronics and connection cables
Spare components for the Acquisition stages, control electronics and cables

Conclusions and Timeline
No response nor expression of interest is expected to this Preliminary Information Note from interested companies.
The publication of the Call for Tender is expected in early Q4 2023.
The Kick Off is expected within Q2 2024

II.2.14) **Additional information**

Additional info can be requested within 30 days from the publication of this Note by email to procurement.maory@inaf.it . The questions (in an anonymous form) and the relative answer will be publicly available at http://wwwmorfeo.oabo.inaf.it/index.php/infolor-faq/ with due advance with respect to the publication of the Call for Tender. No response nor expression of interest is expected.

II.3) **Estimated date of publication of contract notice:**

30/10/2023

Section IV: Procedure

IV.1) **Description**

IV.1.8) **Information about the Government Procurement Agreement (GPA)**

The procurement is covered by the Government Procurement Agreement: yes

Section VI: Complementary information

VI.3) **Additional information:**

Wavefront sensing for MORFEO is performed by six Laser Guide Stars (LGS) and three Natural Guide Stars (NGS), for the measurement of high and low-order wavefront perturbations respectively. The wavefront error compensation is performed by two adaptive post focal Deformable Mirrors (DMs) located inside MORFEO (the core of the instrument), which work together with the telescope's adaptive and tip-tilp mirrors M4 and M5 respectively.
MORFEO is being designed and built by a consortium of partners in Italy, France, Canada and Ireland, together with ESO. INAF, as the leading institute, is responsible for all the major procurements.
The project has completed the Preliminary Design Phase and is entering the Final Design Phase. The final design and the manufacturing of some components will be assigned to external companies. We underline that the manufacturing of the components will be founded only in case the project will successfully pass the Final Design upon review and joint recommendation by the MORFEO Consortium and ESO.
The MORFEO Consortium would like to inform all the industries concerned that within a few months an international public call for tender will be published concerning the final design and the manufacturing of the LOR WFS Acquisition Stages for MORFEO. The call for tender for the stages will be placed in the framework of the general technical specifications described in Section II.2.4 (Description of the procurement) of this prior information notice. A detailed Statement of Work with a detailed description of all the technical specifications will be published with the public call for tender.

VI.5) **Date of dispatch of this notice:**

03/08/2023