

STATEMENT OF WORK (SOW)	Doc. No. SP-391-001-60 R0	LUSI SUB-SYSTEM CXI
<b>Statement of Work for the CXI 0.1 micron KB System, Mirror Metrology</b>		
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Revision	Date	Description of Changes	Approved
R0	25NOV08	Initial release	

## 1. Introduction

The Coherent X-ray Imaging (CXI) instrument to be built at the Linac Coherent Light Source (LCLS) by the LCLS Ultrafast Science Instruments (LUSI) on the SLAC National Accelerator Laboratory site requires a mirror system to produce a 100x100 nm<sup>2</sup> FWHM focal spot at the sample. The mirror system shall be made of 2 mirrors each with an elliptical figure and arranged in a Kirkpatrick-Baez (KB) configuration. The system is known as the CXI 0.1 Micron KB System or KB0.1.

The LCLS will produce a laser-like beam of X-rays in the 800 to 8300 eV range for the fundamental energy. Also, the 3rd harmonic will be present at up to 25 keV. The CXI instrument will use the hard X-ray branch which uses 2 offset mirrors that reflect energies between 2 keV and 25 keV.

The KB mirror combination shall reflect more than 75% of the X-rays over the 2-18 keV range. This will be achieved by using an appropriate coating on the mirrors.

These mirrors will be located in an Ultra-High Vacuum (UHV) environment (10<sup>-9</sup> Torr). They require a very precise positioning system with the mirrors located inside a vacuum enclosure which will be mounted on a stable stand.

## 2. Scope

The vendor shall perform the following tasks described in SLAC document No. SP-391-000-64.

### 1. Mirror metrology

The vendor for this part of the project shall characterize the surface quality of the test coupons (delivered by the mirror substrate vendor), the mirror substrates as delivered and the coating strips deposited by the mirror coating vendor. The metrology measurements to be performed are described in Section 8 of SLAC document No. SP-391-000-64.

## 3. Applicable Documents

- SLAC document No. SP-391-000-24, “Physics Requirements for the CXI 0.1 micron KB System”
- SLAC document No. SP-391-000-64, “Engineering Specifications for the CXI 0.1 micron KB System”
- SLAC document No. SP-391-000-19, “Physics Requirements the CXI Instrument”

- SLAC drawing No. DS-391-000-36, “Mechanical Design Standards Supplement”
- SLAC drawing No. SC-700-866-47, “Specification Kly & Vac Machining Fluids”
- Fed-STD-595B, “Colors Used in Government Procurement”

## **4. Requirements and Specifications**

All requirements and specifications for the mirror metrology measurements to be performed are found in Section 8 of SLAC document No. SP-391-000-64. All specifications in SLAC document No. SP-391-000-64 shall apply except for those in Sections 6, 7 and 9.

### **4.1. Delivery times**

The suggested and desired time durations between the award of the contract and the completion of the metrology tasks is 2 months.

## **5. Quality Assurance Requirements**

All quality assurance requirements for the mirror metrology are found in Section 8 of SLAC document No. SP-391-000-64.

## **6. Selection Criteria**

The potential vendors shall submit a Technical Proposal which shall contain no pricing data of any kind; cost and price information shall be included only in a separate volume. The following sections shall be present in the Technical Proposal and the proposals shall be judged and rank based on the content of each category

### **6.1. Technical Specifications**

The technical proposal will consist of responses to each of the specifications described in SLAC document No. SP-391-000-64. The proposal shall provide written documentation describing how individual specifications are to be met, including substantiating data or schematics where appropriate. An overall layout of the-system, and appropriate detail drawings, shall be included with the proposal.

### **6.2. Delivery and Milestone Schedule**

A delivery and milestone schedule shall be provided. It is preferred that every component of the system be delivered to SLAC by June, 2011. A schedule for installation and acceptance testing of the system at SLAC after delivery, by vendor personnel (if necessary) in conjunction with SLAC personnel, should be provided as well.

### **6.3. Personnel, Experience and Facilities**

Proposer shall provide descriptions of the key technical and management personnel who will be involved in the production, testing, delivery, and acceptance testing of the system, and their relevant experience, A description of production facilities and testing equipment should be provided, A listing of similar systems sold and delivered, and to whom, including sale and delivery dates, should also be provided. If subcontractors are planned to be used, similar information on the subcontractors shall also be included.

#### **6.4. Quality Assurance, Implementation and Performance Verification**

The proposer will provide a quality assurance plan, which includes provision for performance verification of major sub-components of the system. The plans for implementation, performance testing and acceptance testing should be clearly described. The quality-assurance plan should include the possibility of access to the vendor's facility, and that of any major sub-contractor during production, by SLAC representatives. Subcontractors should be identified and their quality assurance procedures should also be documented.

#### **6.5. Financial Solvency**

The proposer shall provide evidence of financial stability in order to demonstrate its capability to carry the project to its completion.