IPRO 309

Integrated Turn-Key X-Ray Fluorescence Analysis System Using Bent Laue Optics

Sponsored by Quercus X-Ray Technologies, LLC

This IPRO team project explores different conceptual designs for an integrated, self-aligning X-ray fluorescence analyzer which utilizes the Bent Crystal Laue Analyzer technology developed by Quercus X-Ray Technologies and IIT's CSRRI. In addition to researching and evaluating technologies relevant to the construction of such a system, this project endeavors to design system prototypes using different combinations of promising or innovative technologies. This semester, the team focused primarily on researching technologies relevant to the development of prototype systems and recommending promising technologies for further evaluation.

Research has been conducted successfully, leading to the completion of whitepapers on the topics of X-ray detection, positioning and motion control, and data acquisition and control. Additionally, the team has identified promising technologies and has begun the process of acquiring and evaluating products. Through the course of the semester, the team has negotiated several obstacles: a lack of sufficient laboratory space, computer failure, and system integration issues. The greatest obstacle to overcome was the time constraints imposed by product acquisition (shipping, wrong parts). Despite these difficulties, the team has successfully laid the groundwork for the continuation of this IPRO. Over the course of the next two semesters, the IPRO team should focus their efforts on continuing the evaluation of the recommended technologies, developing and testing prototypes, and refining their designs.

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