23-7: System for Photogrammetric Imaging, Detection, and Ranging (SPIDR)

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Activity Type: New Start

Primary STMD Taxonomy: TX13.1.2 Launch/Test/Ops Site Management

Starting TRL: 3 **End TRL:** 4

Executive Summary: The System for Photogrammetric Imaging, Detection, and Ranging (SPIDR) project aims to advance the state-of-the-art (SOA) technology in camera tracking. SPIDR will advance this technology in the following ways: 1) perform autonomous tracking of rocket launches, 2) allow modularity for camera payloads to enable various types of imagery capture (standard video, high-speed, infrared, etc.), 3) enable additional imagery assets for increased scope of imagery analysis, and 4) serve as a viable tracking replacement for the existing Kineto Tracking Mount (KTM) system used by the Exploration Ground Systems (EGS) program. The project initially aimed to build an in-house mechanical design and control system, but realigned to a commercial off-the-shelf (COTS) mechanical design. During the FY23 CIF timeline, the SPIDR team made significant advances in building a machine-learning (ML) based object detection model for various rockets and their plumes. The team will continue advancing the model, and begin work on the pan and tilt unit (PTU) control system and tracking algorithm development.