Reduced Envelope Multispectral Imager (REMI) for Sustained Land Imaging

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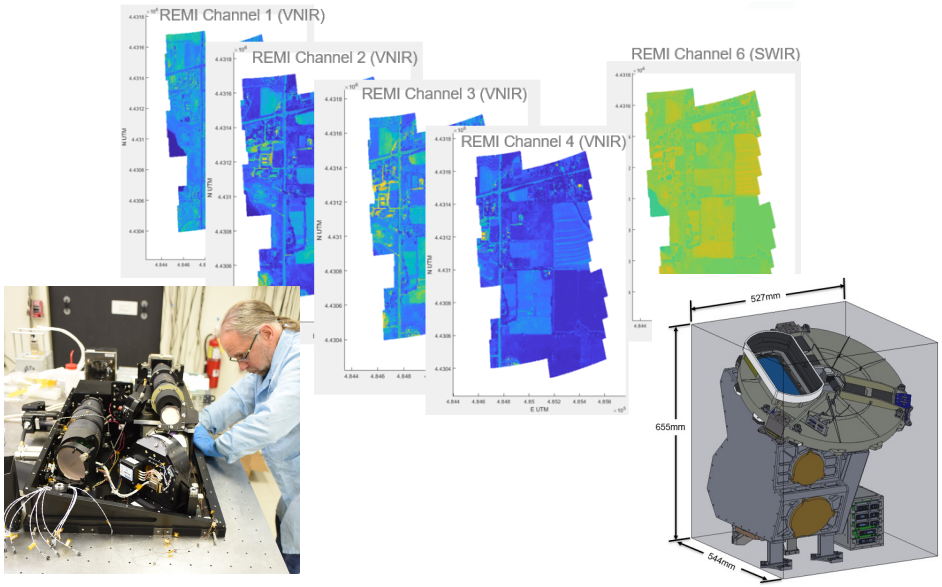
Objective

- Develop a reduced envelope multispectral instrument for SLI and perform an airborne demonstration.
- Demonstrate that the image motion control enabled by the scan mirror technology allows for longer integration times, while keeping the same cross track field of regard. The reduction of the aperture allows for similar reduction in mass and volume, resulting in a smaller payload, while maintaining SLI reference mission requirements.
- Collect airborne measurements that demonstrate successful operation of the mirror, resulting in: 100% coverage of the scene, disturbance rejection, proper geolocation, and edge response.
- Develop space flight instrument concepts and SWaP resource estimates demonstrating the ability of the REMI concept to be hosted on an ESPA class spacecraft.
- Model performance of the REMI concept in a Landsat type orbit and compare to SLI reference mission as well as the enhanced requirements.



Accomplishments

- Completed early design trades, full airborne instrument design, performance analysis and resource requirements for airborne integration.
- Manufactured, integrated subsystems and components into full airborne instrument.
- Completed functional, optical performance characterization and radiometric calibration of the REMI instrument.
- Integrated the REMI instrument to an aircraft and conducted an engineering flight and two science flight campaigns.
- Analyzed data from each fight to uncover issues and identify improvements for future flights – implement improvements.
- Analyzed flight data, comparing performance against SLI-T RMA objectives, goals and requirements.
- Successfully demonstrated the image motion control implementation using the scan mirror – enabling the miniaturization of a SLI instrument.
- Data collected during airborne campaign was shared with Landsat Science Team for further processing and verification
- Re-packaged the REMI hardware into a space flight configuration utilizing high TRL heritage flight components, resulting in significant reduction in mass and volume for the comparable Landsat 8/9 sensor.

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TRL_{in}= 3 **TRL_{out}= 5**