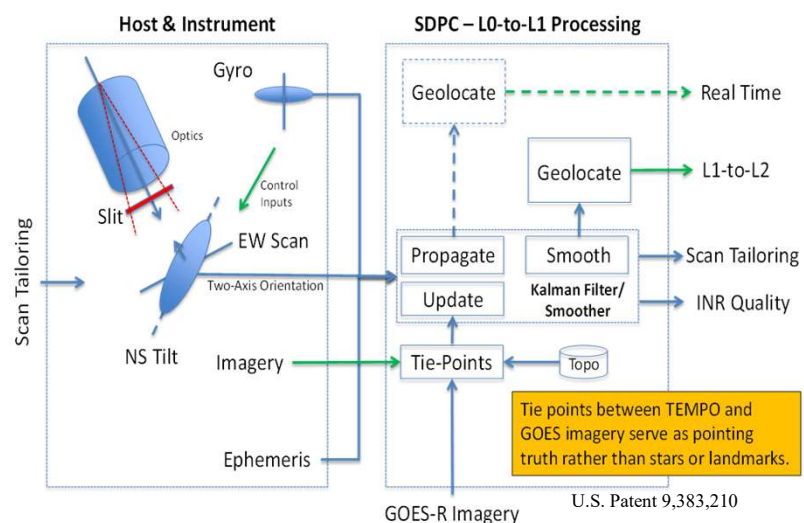
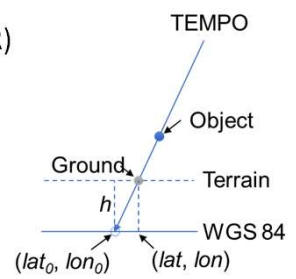


# Image Navigation and Registration for TEMPO

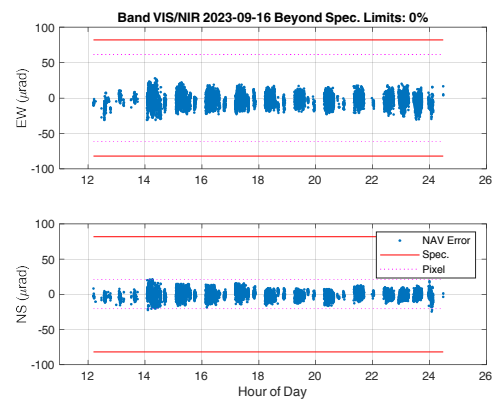
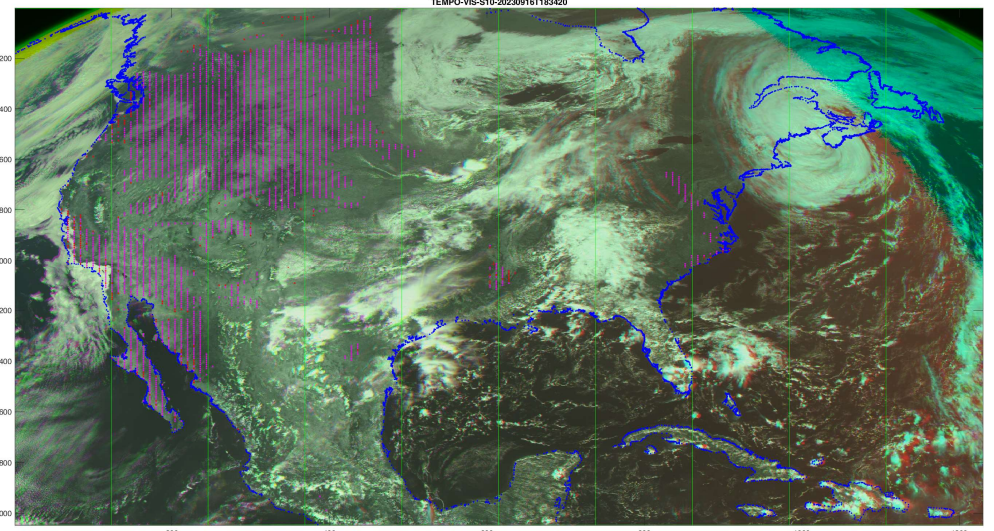
J. Carr<sup>1,\*</sup>, X. Lei<sup>1</sup>, J. Houck<sup>2</sup>, J.E. Davis<sup>2</sup>, S. Yang<sup>1</sup>, X. Liu<sup>2</sup>, and K. Chance<sup>2</sup>  
<sup>1</sup>Carr Astronautics, Greenbelt MD, <sup>2</sup>SAO, Cambridge, MA

- TEMPO Image Navigation & Registration (INR) locates pixels on the WGS 84 Ellipsoid
- TEMPO INR relies on GOES-R ABI Imagery as Pointing Truth (“Tie Points”)
- Kalman Filter-Smoother models Image Geometry and updates with Tie Points

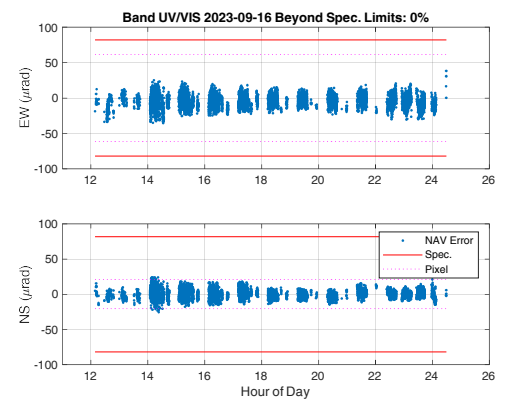


- Onboard GPS used for orbit determination
- Binocular Tie Points (w/ GOES-East & -West) enables features of unknown altitude (e.g., clouds) to serve as Tie Points
- Geometric model includes attitude, magnification, slit curvature, magnification variation, scanner polynomial, alignment between UV and VIS focal plane arrays

## Verification (Single Scan) versus Parallax-Corrected Clear-Sky GOES-R ABI



Versus ABI B02



Versus ABI B01