FIG WORKING WEEK 2023
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Protecting Our World, Conquering New Frontiers

Optimizing the Accuracy and Efficiency of Mobile Mapping and Surveying using the Latest GNSS Constellations and Frequencies and LiDAR Adjustment Technology

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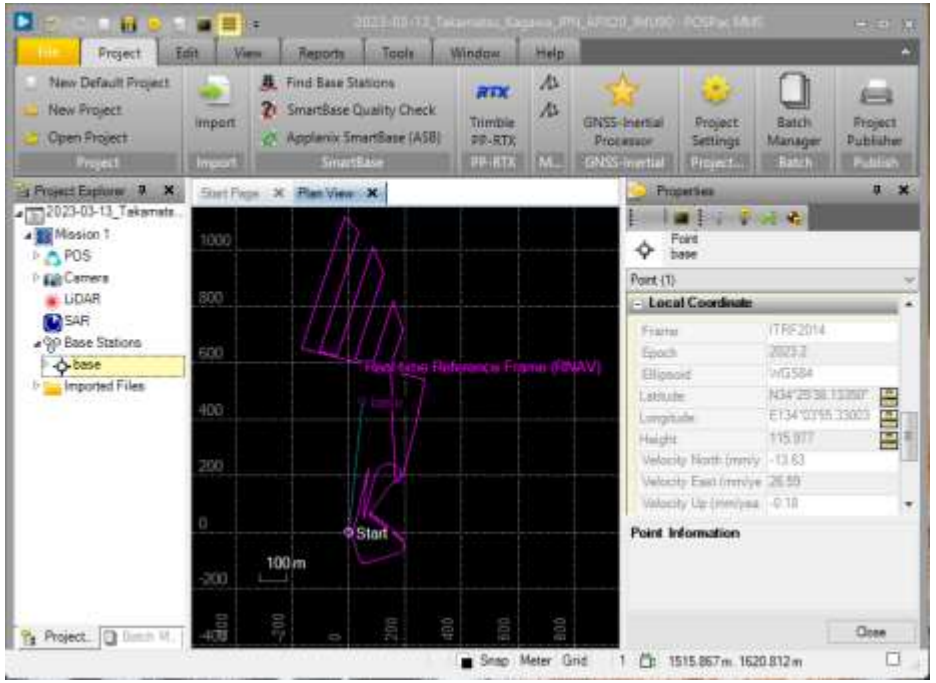
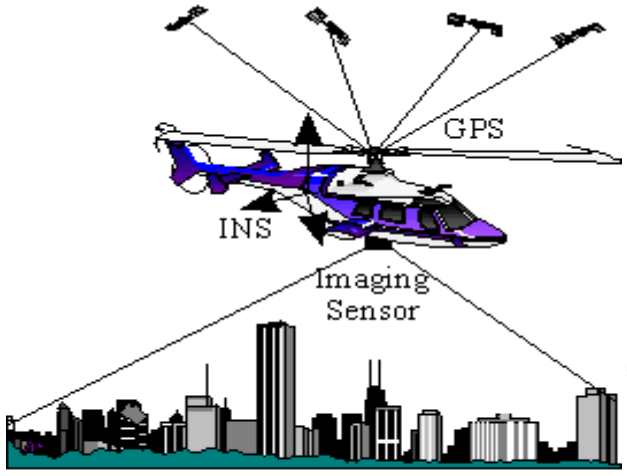
Introduction

- New features in Applanix POSPac 9.0 MMS
  - POSPac desktop application that employs an advanced aided-inertial fusion engine to georeference data collected mobile platforms
  - Incorporates latest Trimble GNSS Technologies

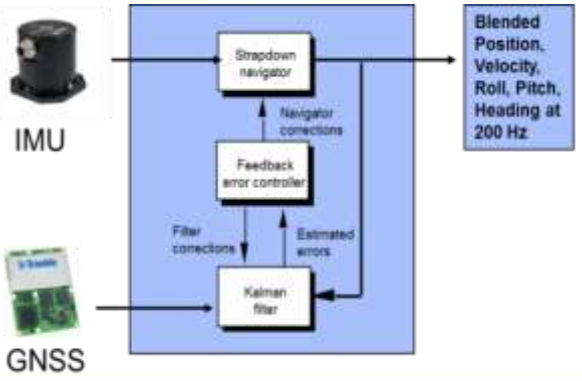


Mobile Mapping and Direct Georeferencing

- Mobile platforms improves the efficiency of making maps
- Direct Georeference Lidar points or Image pixels
- GNSS-Aided Inertial Processing
  - Position accuracy depends on GNSS measurements
  - Orientation accuracy depends inertial sensors and vehicle dynamics

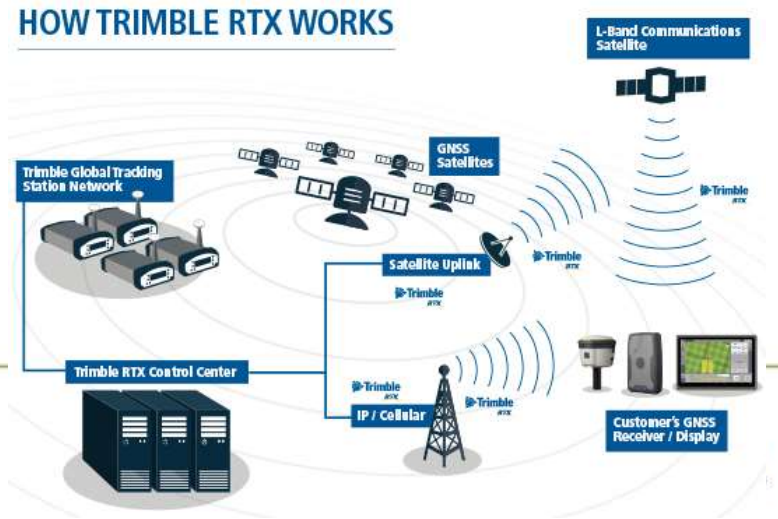


Earth Surface Mapping by Imagery/INS/GPS



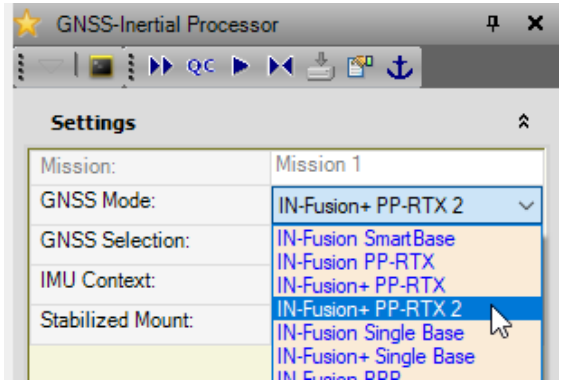
Trimble's Centerpoint™ RTX and Propoint™ (GNSS only)

- Trimble Centerpoint™ RTX (Real-time Extended)
  - PPP with ambiguity resolution
  - Global network ~120 stations which track GNSS Obs.
  - Compute and transmit correction data inc. atmospheric
  - RTX Global vs. RTX Fast
- Trimble Propoint™ GNSS Processor
  - Processes all GNSS signals (Beidou B3 and Galileo E6)
  - Advanced multi-path mitigation
  - Differential GNSS and RTX (i.e. PPP)

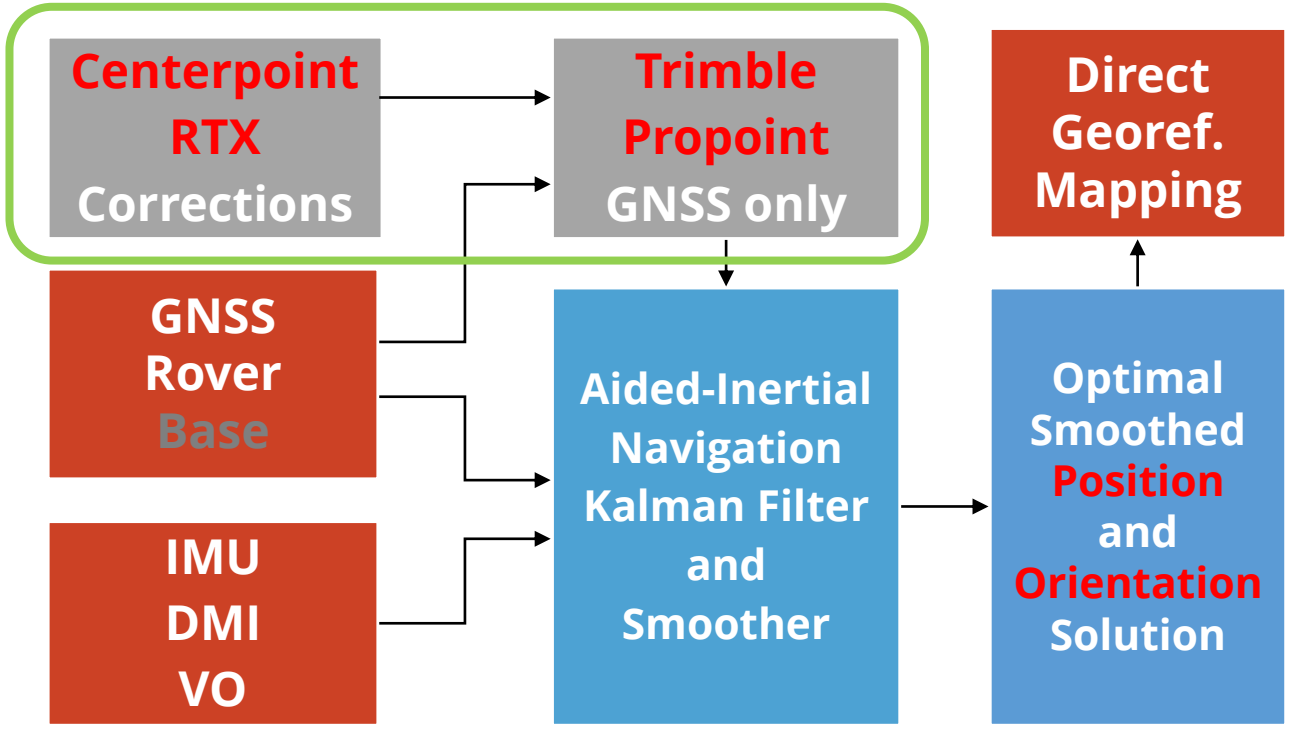


POSPac9.0 MMS: New IN-Fusion+ Feature

- IN-Fusion+ incorporates latest Trimble GNSS technologies
  - Centerpoint™ RTX (Upgrade)
  - Trimble Propoint™ (New)



*PP-RTX: Post-Processed RTX



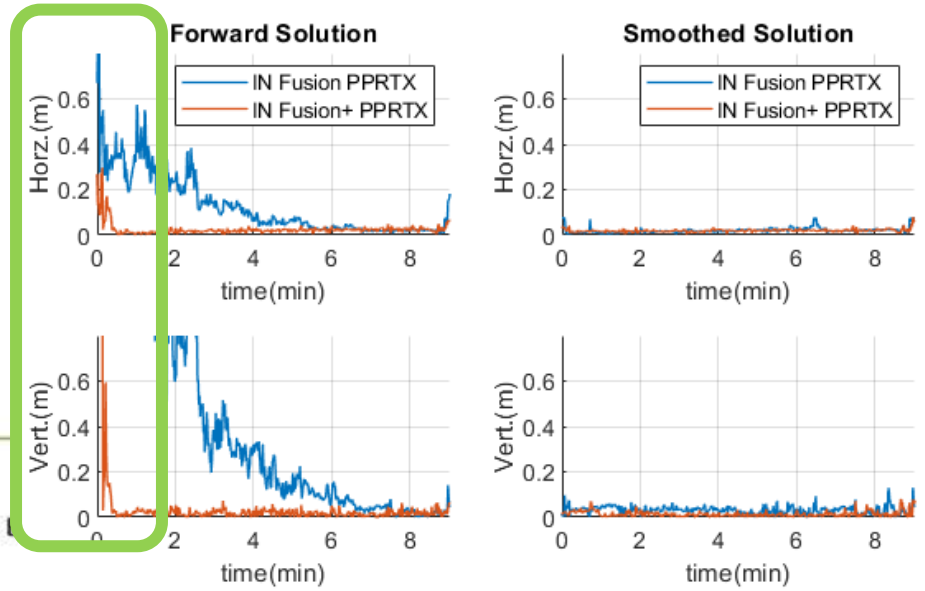
Test Results: In-fusion+ PP-RTX2 (UAV data) vs. Singlebase(ref)

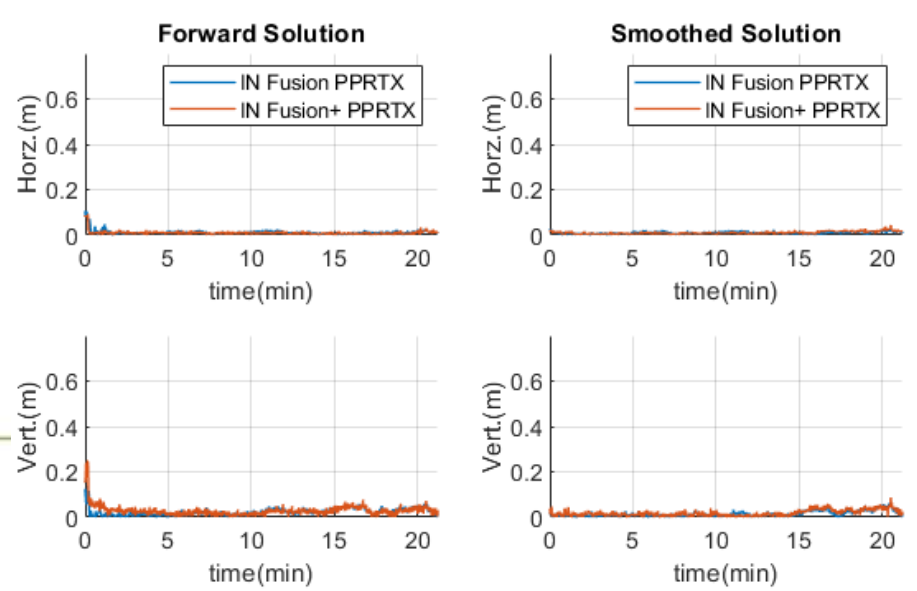
RTXRegion=Global NumOfDatasetsUsedInStats=35 TotalTimeUsedInStats=7.0hrs

	IN-Fusion PPRTX			IN-Fusion+ PPRTX		
	mean	std	rms	mean	std	rms
North(m)	0.008	0.03	0.03	0.002	0.014	0.014
East(m)	0.061	0.181	0.19	-0.006	0.01	0.011
down(m)	-0.057	0.177	0.18	-0.021	0.046	0.05

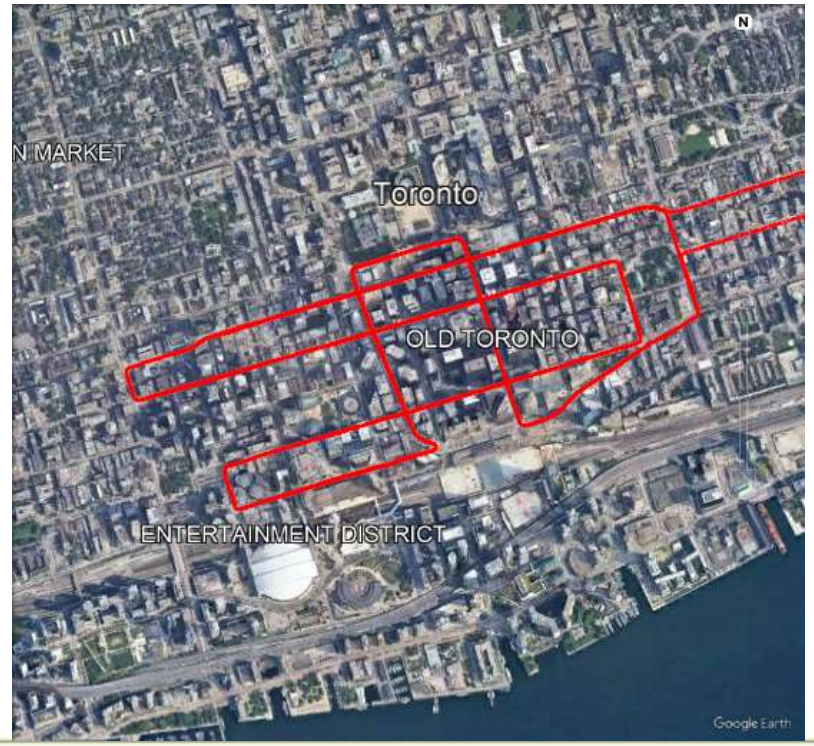
RTXRegion=Fast NumOfDatasetsUsedInStats=209 TotalTimeUsedInStats=70.1hrs

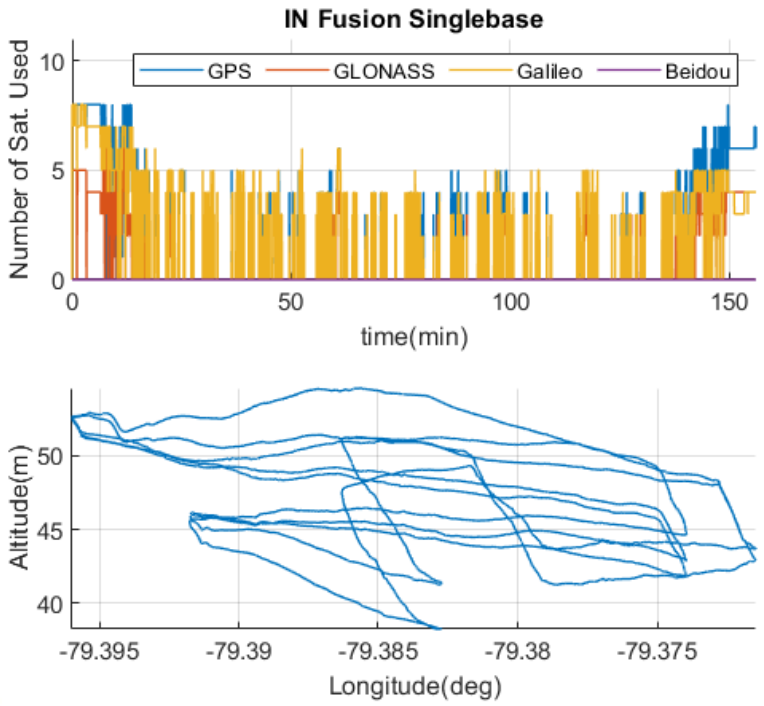
	IN-Fusion PPRTX			IN-Fusion+ PPRTX		
	mean	std	rms	mean	std	rms
North(m)	-0.003	0.012	0.013	-0.003	0.013	0.013
East(m)	0.000	0.009	0.009	0.001	0.010	0.010
down(m)	0.031	0.046	0.056	0.033	0.049	0.059

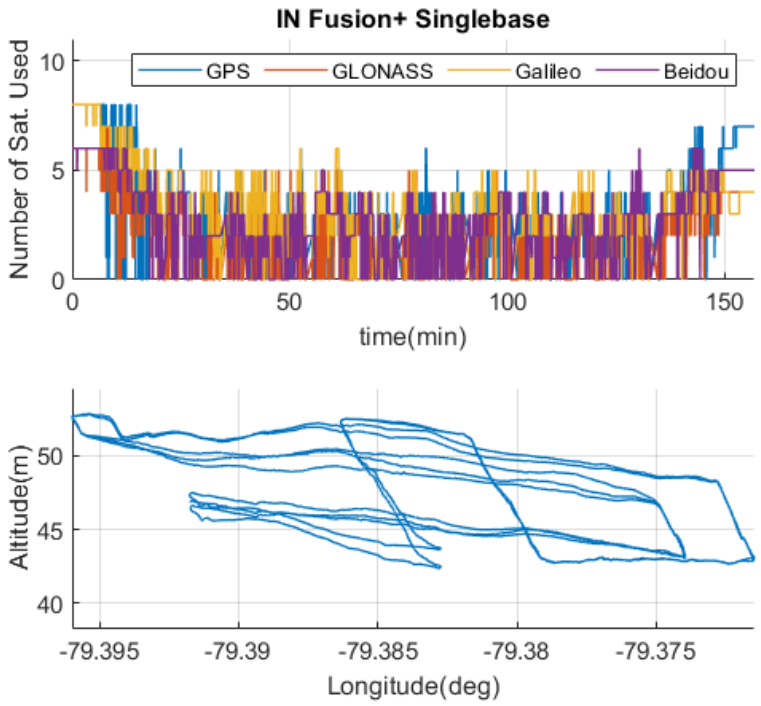




Test Results: In-fusion+ Singlebase GNSS (Urban Canyon)

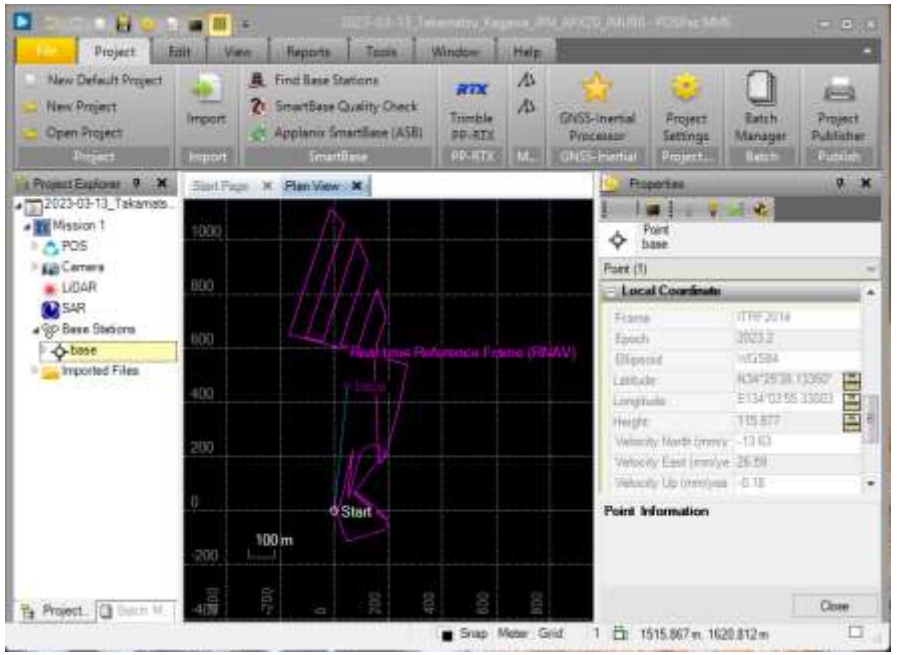






Conclusions

- New Features in POSPac 9.0 MMS
  - Centerpoint™ RTX (Upgrade) i.e. PPP
  - Trimble Propoint™ (New)
- IN-Fusion+ PP-RTX for UAV datasets
  - Fast convergence in RTX Global regions (< 3 mins)
  - Short UAV datasets can be used (10-15mins)
- IN-Fusion+ Single base Urban/Canyon datasets
  - More GNSS signals, more acccurate position



Thank you for you attention!

Go to the paper for details and more features.

Questions?