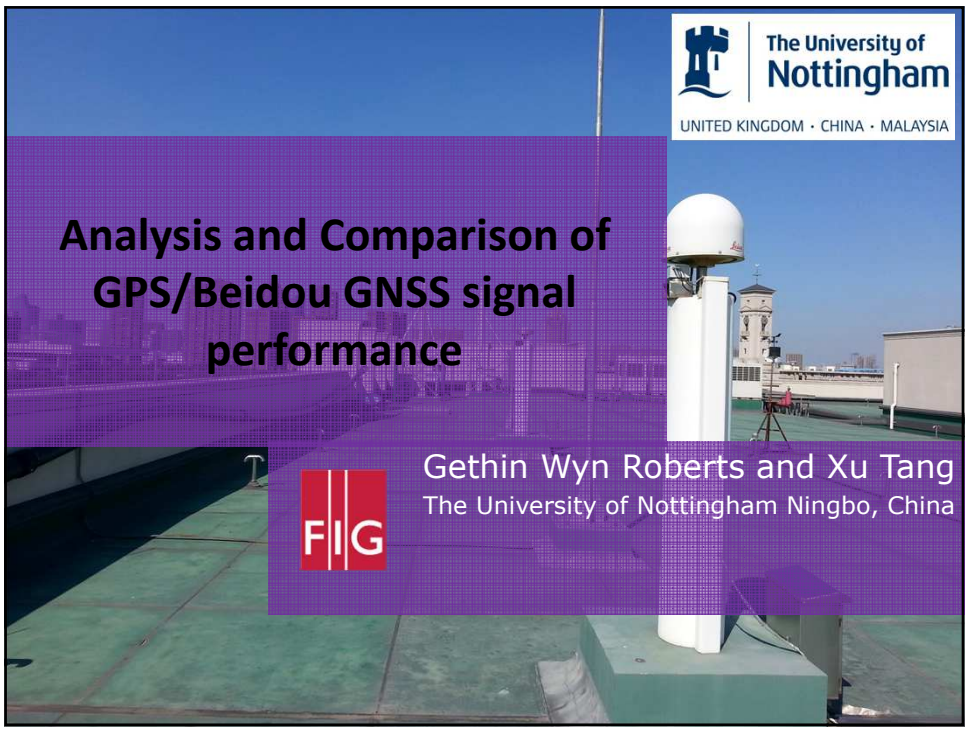

Outline

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- Advantages of GNSS and GPS-BeiDou in particular
- Layout of experiment
- Results
- Conclusions

GPS-BeiDou Advantages

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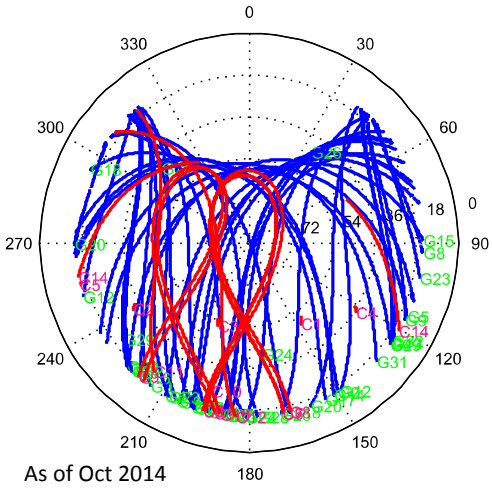

As of Oct 2014

BeiDou Constellation

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PRN	Type	Launch Time	Longitude	Latitude	Approximate Height
C01	GEO	2010/ 01/ 07	140.07° *E*	0°	36, 000*km*
C02	GEO	2012/ 10/ 25	80.22° *E*	0°	36, 000*km*
C03	GEO	2010/ 06/ 02	110.56° *E*	0°	36, 000*km*
C04	GEO	2010/ 11/ 01	160.00° *E*	0°	36, 000*km*
C05	GEO	2012/ 02/ 25	58.65° *E*	0°	36, 000*km*
C06	IGSO	2010/ 08/ 01	104.63° *E* – 136.05° *E*	54.61° *S* – 54.61° *N*	36, 000*km*
C07	IGSO	2010/ 12/ 18	102.60° *E* – 134.13° *E*	54.81° *S* – 54.81° *N*	36, 000*km*
C08	IGSO	2011/ 04/ 10	100.49° *E* – 133.82° *E*	56.02° *S* – 56.02° *N*	36, 000*km*
C09	IGSO	2011/ 07/ 27	80.12° *E* – 111.79° *E*	54.93° *S* – 54.93° *N*	36, 000*km*
C10	IGSO	2011/ 12/ 02	78.66° *E* – 110.33° *E*	54.93° *S* – 54.93° *N*	36, 000*km*
C11	MEO	2012/ 04/ 30	180° *E* – 180◦ *W*	55.31° *S* – 54.61° *N*	21, 500*km*
C12	MEO	2012/ 04/ 30	180° *E* – 180◦ *W*	55.25° *S* – 54.81° *N*	21, 500*km*
C13	MEO	2012/ 09/ 19	180° *E* – 180◦ *W*	54.99° *S* – 56.02° *N*	21, 500*km*
C14	MEO	2012/ 09/ 19	180° *E* – 180◦ *W*	55.10° *S* – 59.93° *N*	21, 500*km*

As of Oct 2014

BeiDou Constellation

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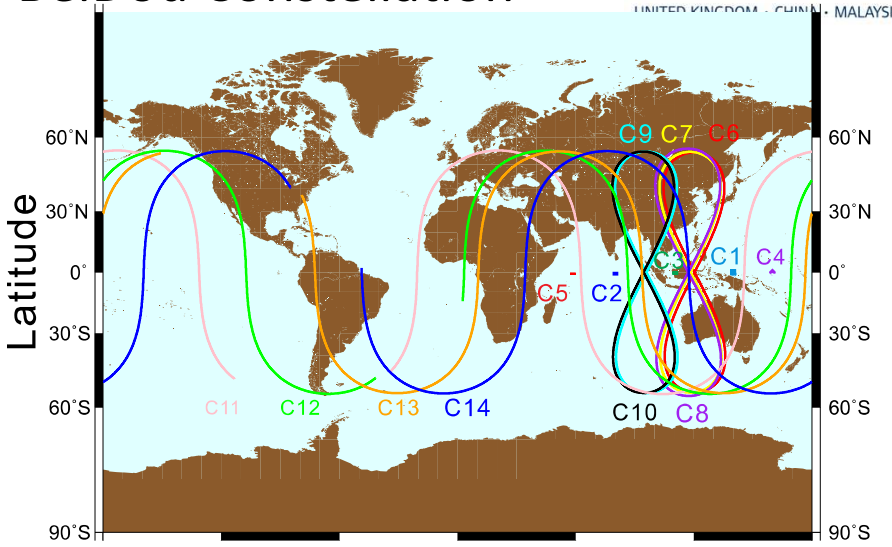

Multi GNSS Advantages

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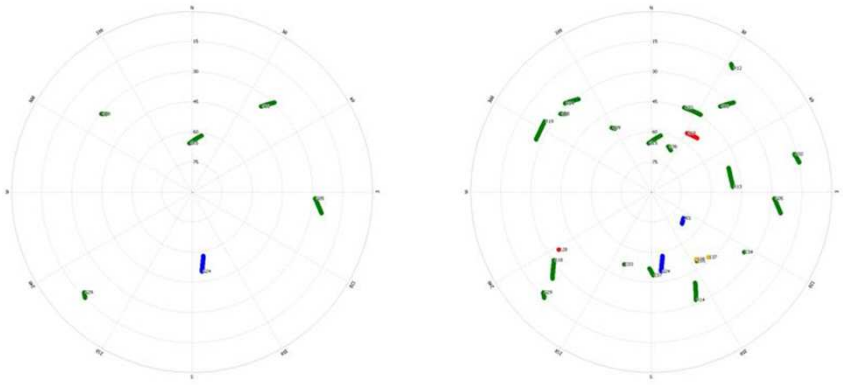

5 Minutes of data, more realistic sky plots for kinematic data

Multi GNSS Advantages

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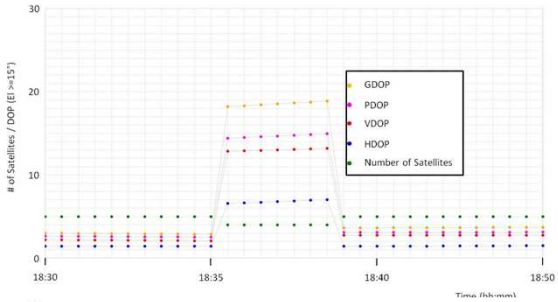
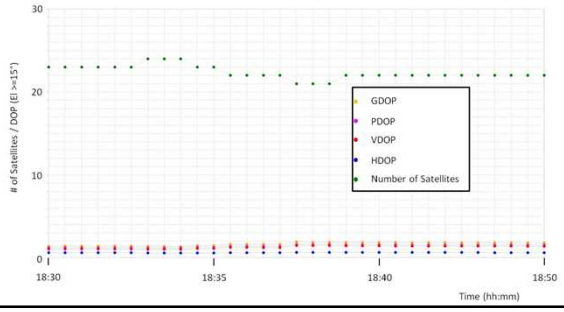


GPS Only



All GNSS

Rooftop Pillars

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Zero Baseline Test

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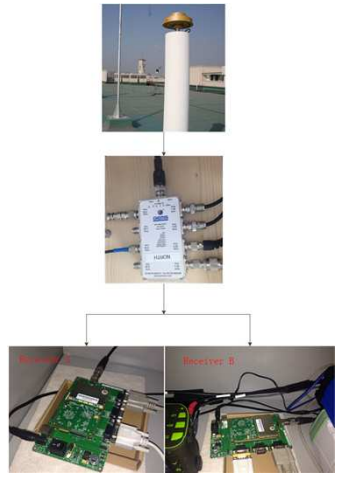
- 2 ComNav K508 Receivers
- Connected to a Choke Ring antenna
- Using Antenna Cable Splitter (PN:GS18)
- Track GPS L1, L2, L5 BeiDou B1, B2, B3 both GLONASS



Zero Baseline Test

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- Both receivers tracking the same signals
- All external error sources, including Multipath, are differenced away
- Resulting noise in the processed results are the observation resolution as well as the noise due to the satellite geometry spread

Available Satellites

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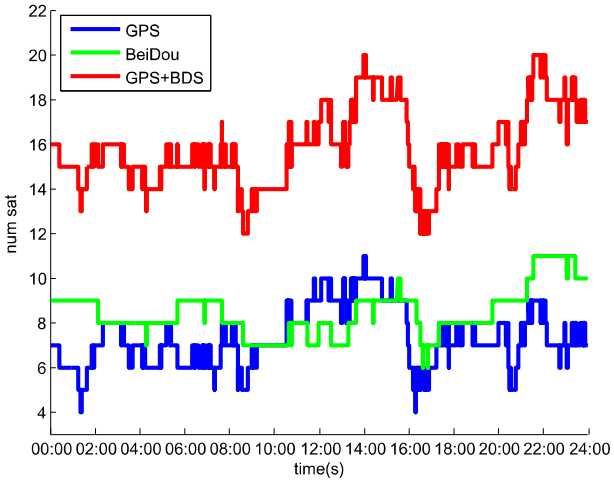

East-West component

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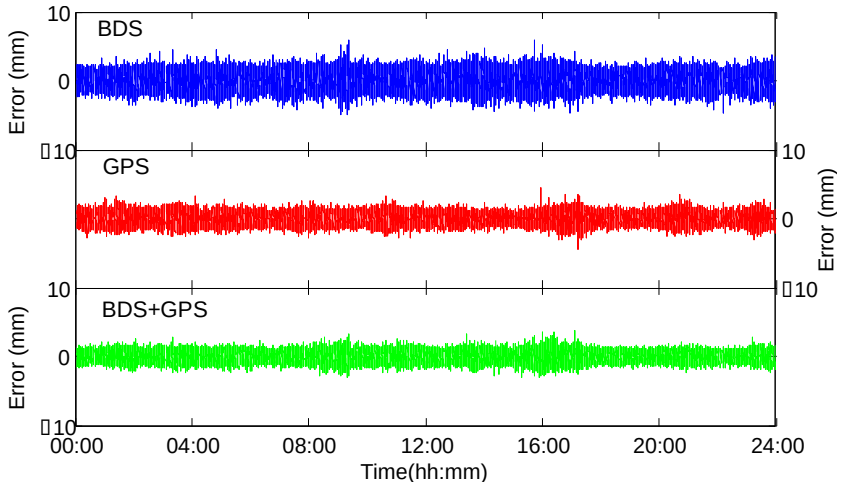
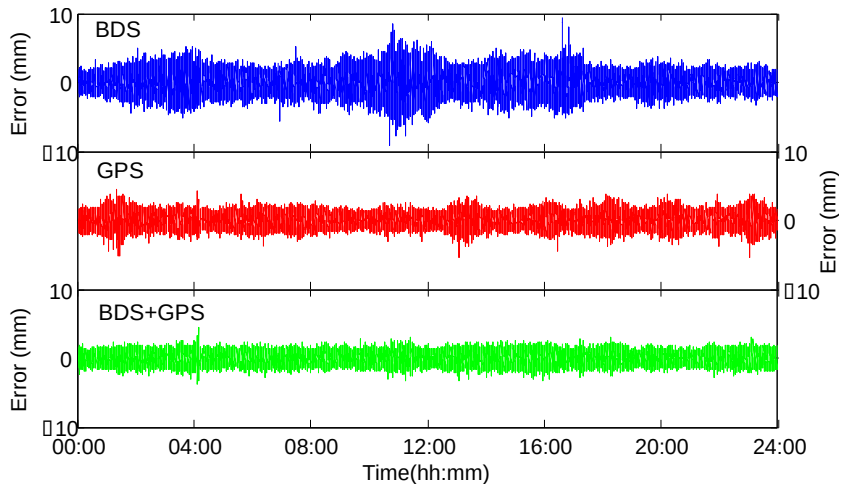
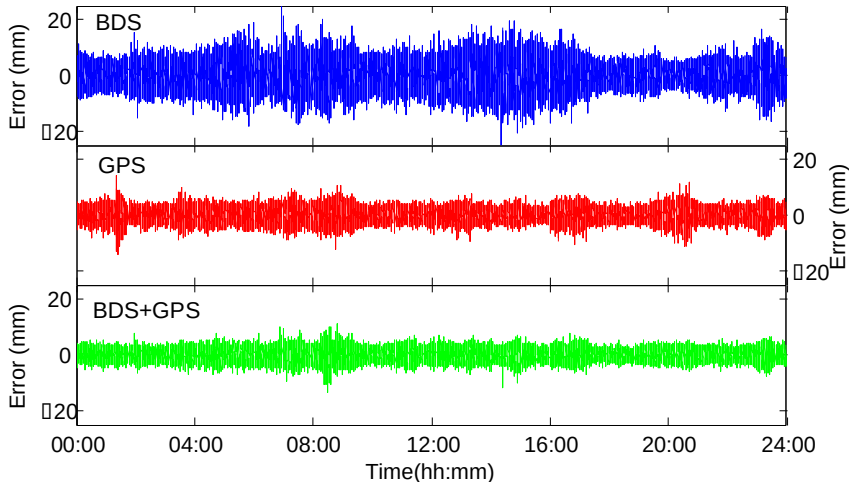


North-South component



Vertical component



Error Distribution

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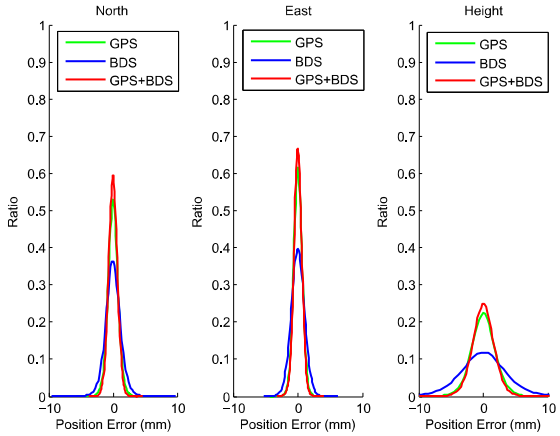

Conclusions

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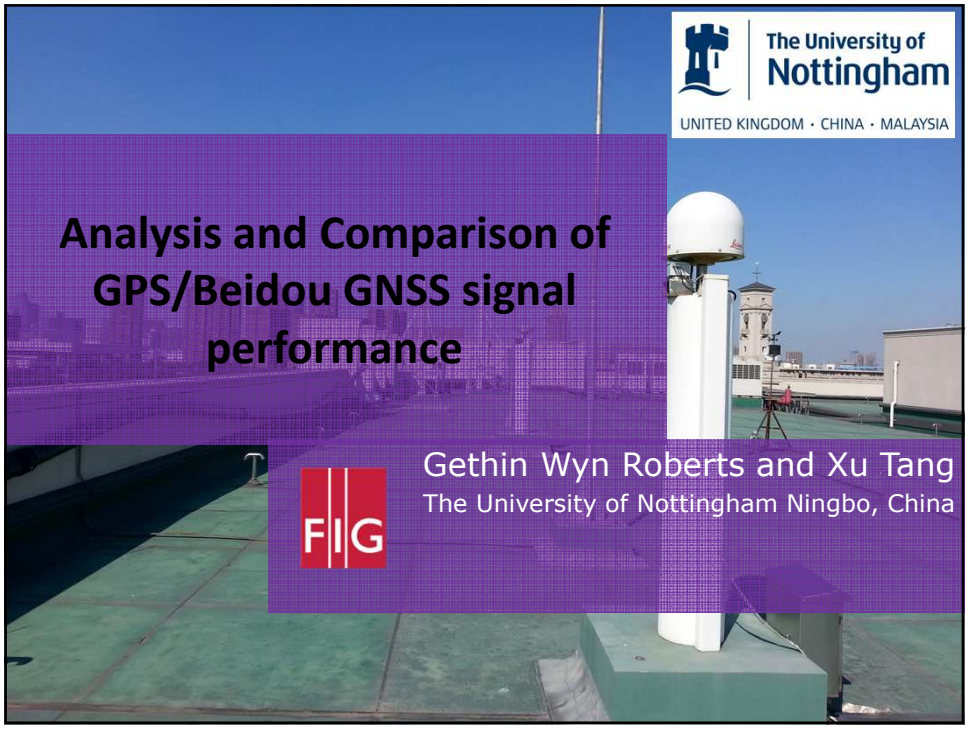
- Multi-GNSS a big advantage
- Especially in built up areas
- Research into triple frequency ambiguity resolution
- Improves geometrical spread of satellites for kinematic applications in particular.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Analysis and Comparison of GPS/Beidou GNSS signal performance
FIG
Gethin Wyn Roberts and Xu Tang
The University of Nottingham Ningbo, China