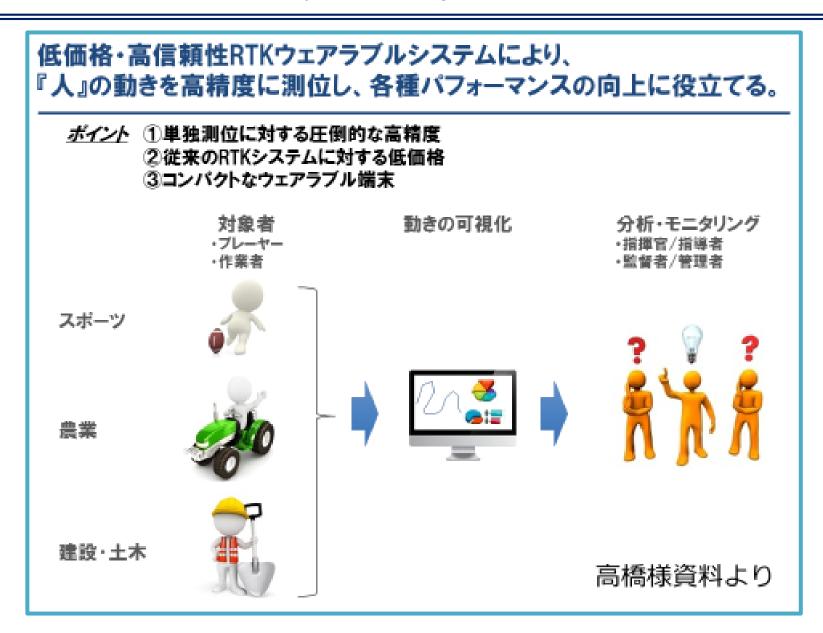
Asian Base Station Network Project Report

13/09/2015 Hiroko Tokura

Collaborate with Sport Project



Contributions of position errors

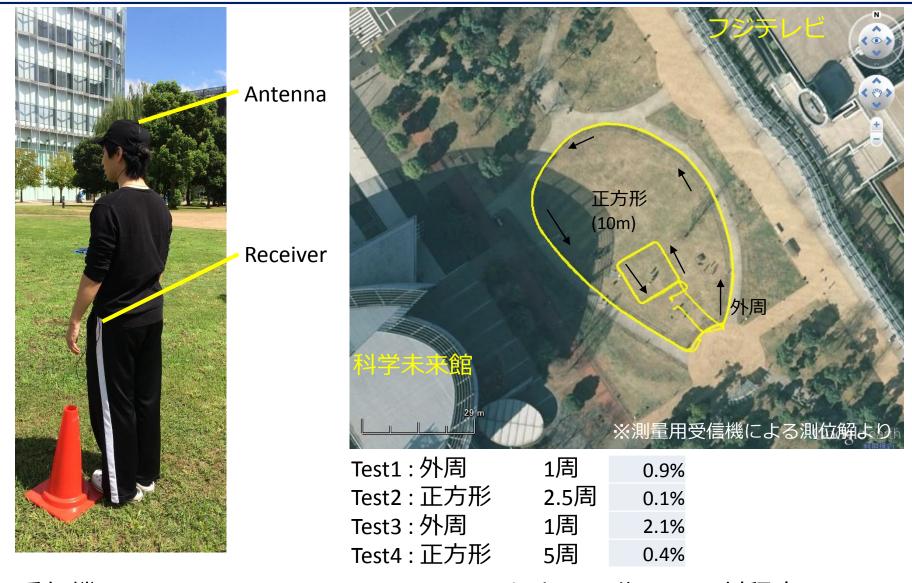
signal



Direct signal from high-elevation satellite

Signal Blocked by building

Wearable RTK Test conditions



受信機 UBLOX-M8T GPS/QZSS/BeiDou およそ20分5Hz 3割程度でラン

How to tuning using RTKLIB - RTKPOST

RTKPOST ver.2.4.2		
Image: Second	Options Setting1 Setting2 Output Stats Posi	tions Files Misc
RINEX OBS: Rover ? Image: Constraint of the second	Positioning Mode	Kinematic •
RINEX OBS: Base Station D:¥rawdata¥2015¥150902¥0902_023917kaiyo_ref.obs v	Frequencies / Filter Type Elevation Mask (°) / SNR Mask (dBHz)	15 •
RINEX *NAV/CLK, SP3, IONEX or SBS/EMS D:¥rawdata¥2015¥150902¥5245K53320201509020300C.15P	Rec Dynamics / Earth Tides Correction Ionosphere Correction	OFF OFF Broadcast
• • • •	Troposphere Correction Satellite Ephemeris/Clock	Saastamoinen 💌 Broadcast 💌
Solution Dir D:¥rawdata¥2015¥150902¥LOG0006.pos v	Sat PCV Rec PCV PhWindup	Reject Ed RAIM FDE
D:#rawdata#2013#150902#LOG0006.pos •	Excluded Satellites (+PRN: Included)	SBAS V BeiDou
Bot Jew To KML Qptions Execute Exit	Load Save	OK Cancel

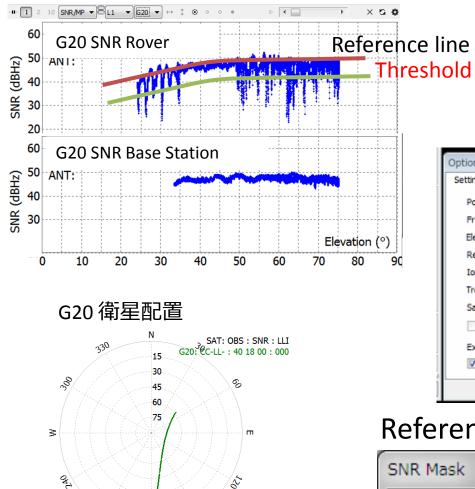
✓ Elevation Mask

(low angle satellites are strongly affected by multipath)✓ SNR Mask

(Checking the SNR dependent elevation for detecting multipath errors)

SNR Mask

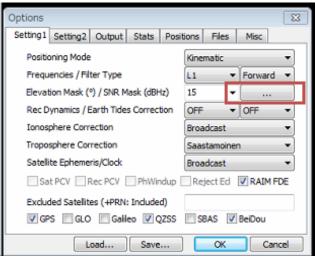
510



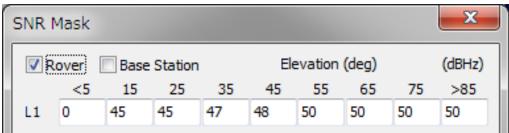
051

s

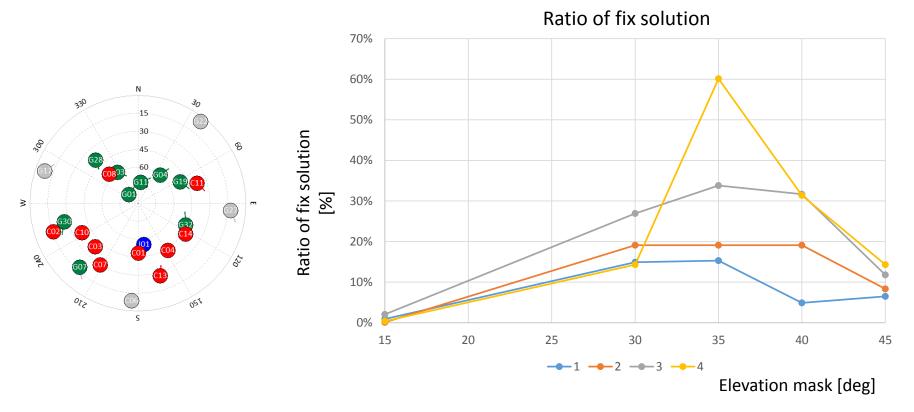
- Multipath affected signals SNR is disturbed
- To reject low quality signals, Masking SNR is effective



Reference line



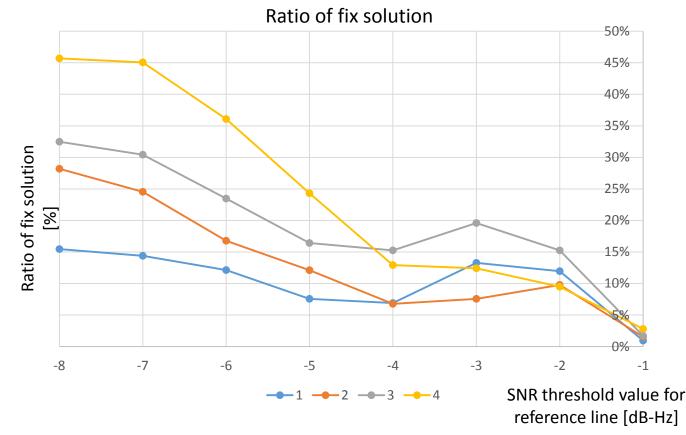
Effects of Elevation Mask



 Changing the elevation mask angle to reduce the multipath errors

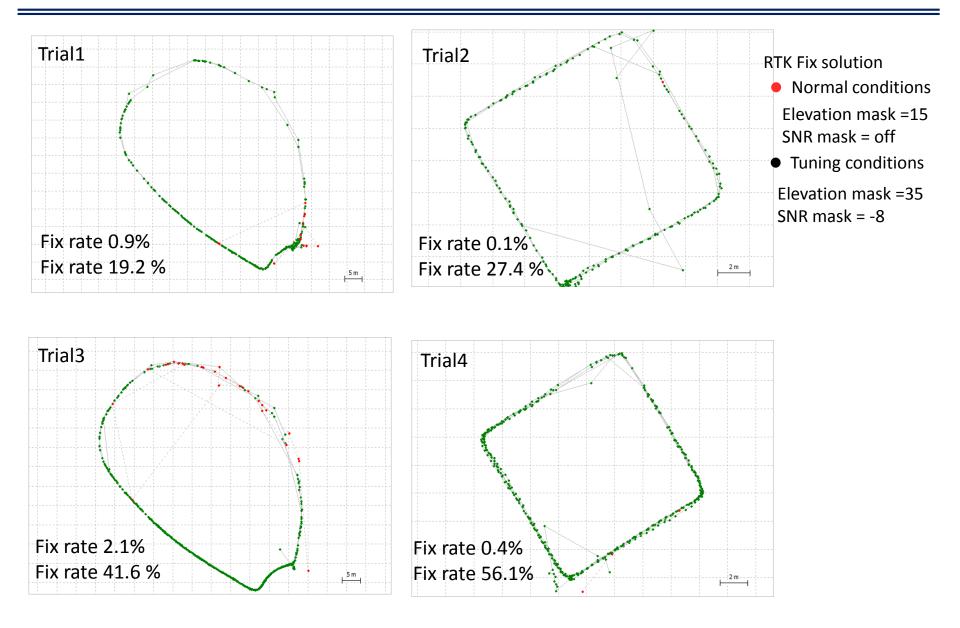
Effects of SNR Mask

• Change these threshold for -1 to -8



 Changing the SNR threshold mask for -1 to -8 to reduce the multipath errors

Final Results



Wearable RTK System

Conclusions and future work

Conclusions

- Two ways for improving accuracy in sub-urban area
- These threshold is depend on the environment
- ⇒ find optimization threshold for obtain high accurate solution

Future work

- Positioning accuracy
 - coupling with velocity information

• Thank you!