

IGS Antenna Working Group

Current status and challenges

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Overview

- IGS14.ATX:

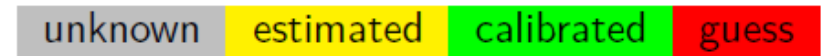
- **Galileo and QZSS pre-launch satellite chamber calibrations are included**
- GPS, GLONASS: Estimated PCOs / PCV (nadir dependent)
- Beidou: Approximated PCOs / no PCVs
- Galileo, QZSS: Pre-launch chamber calibrations released
- Receiver antennas:
 - Mostly robot calibrations provided by Geo++
 - L1/L2 for GPS and GLONASS
 - Missing E5 for Galileo

Current status of antenna calibrations

Overview

GNSS	Frq	Sat.	Rob.
GPS	L1	estimated	calibrated
	L2	estimated	calibrated
	L5	unknown	unknown
GLO	G1	estimated	calibrated
	G2	estimated	calibrated
	G3	unknown	unknown
GAL	E1	calibrated	guess
	E5a	calibrated	guess
	E5b	calibrated	guess
	E5	calibrated	unknown
	E6	calibrated	unknown

GNSS	Frq	Sat.	Rob.
BDS	B1	guess	guess
	B2	guess	guess
	B3	guess	unknown
QZSS	L1	calibrated	calibrated
	L2	calibrated	calibrated
	L5	calibrated	unknown



Rob. : roboter calibrations

Ongoing tasks

How should this be addressed?

- The impact of missing L5 pattern needs to be studied
- IGS call for chamber calibrations including E5 for test purpose
 - More than 5 institutions replied and provided their calibrations
 - University of Bonn provided their chamber calibrations for antennas used in the IGS network
 - More than 250 individual calibrated receiver antennas available
- Results will be presented later during this session
 - Chamber calibrations for E5
 - Impact for POD

Future challenges

New satellites / new satellite types

Upcoming GNSS Satellite Launches				
System	Satellite	Launch Site	Launch Date (UTC)	Launch Time (UTC)
BeiDou-3	M15, M16	Xichang	15 October 2018	~04:15
BeiDou-3	M17, M18	Xichang	November 2018	TBD
GLONASS	GLONASS-M 60	Plesetsk	3 November 2018	TBD
GPS	GPS 3-1	Cape Canaveral	15 December 2018	14:08
GPS	GPS 3-2	Cape Canaveral	4 April 2019	TBD
GLONASS	GLONASS-K2	Plesetsk	Mid-2019	TBD
GPS	GPS 3-3	Cape Canaveral	October 2019	TBD
WAAS	Intelsat Galaxy 30	Kourou	First half 2020	TBD

Updated: 11 October 2018

[GPS Solutions, <http://gpsworld.com/resources/upcoming-gnss-satellite-launches/>]

Future challenges (1/2)

- New satellite launches
 - IGS ANTEX file: preliminary PCO values published
 - Derived from available PCOs from the same satellite types
 - Launch of new GPS Block III satellites:
 - First of their kind → no estimations available
 - No PCO available
 - Preliminary values will be derived from satellite sketches (satellite dimensions)
 - Beidou 3 satellites
 - Which patterns should be added to the IGS ANTEX 14 file?

Future challenges (2/2)

- How to continue with missing L5 patterns?
 - Will be discussed during the splinter meeting
- Update of the ANTEX format (to Version 2.0)

- Andria Bilich, Benjamin Erickson:
6-axis robot for absolute antenna calibration at the US National Geodetic Survey

- Susanne Beer, Lambert Wanninger:
Group Delay Variations of Galileo Satellite Antennas