



LAND SURVEY OFFICE



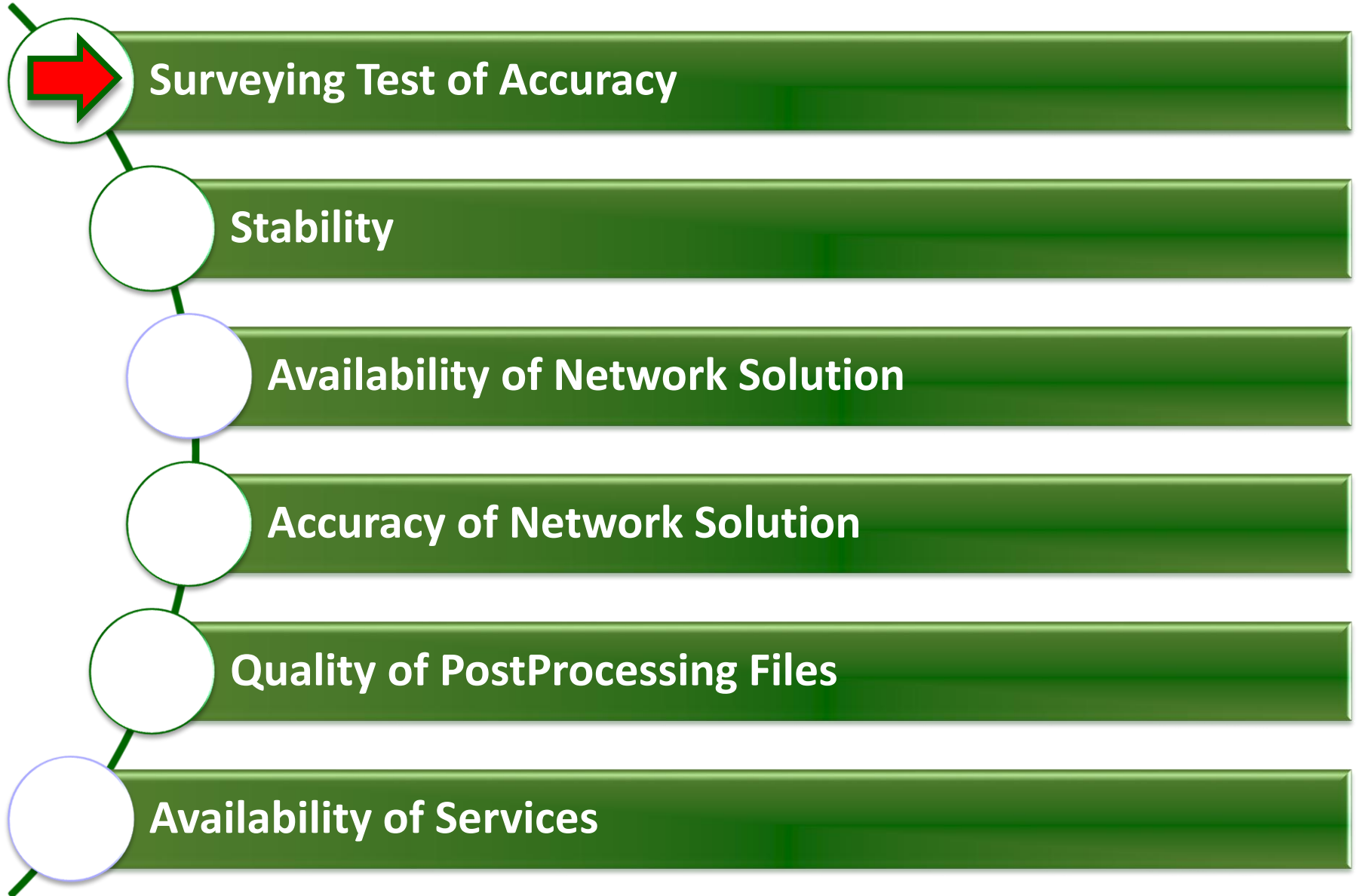
European Position Determination System

Quality Control of Czepos Network Experience

Land Survey Office, Department of Geodetic Control

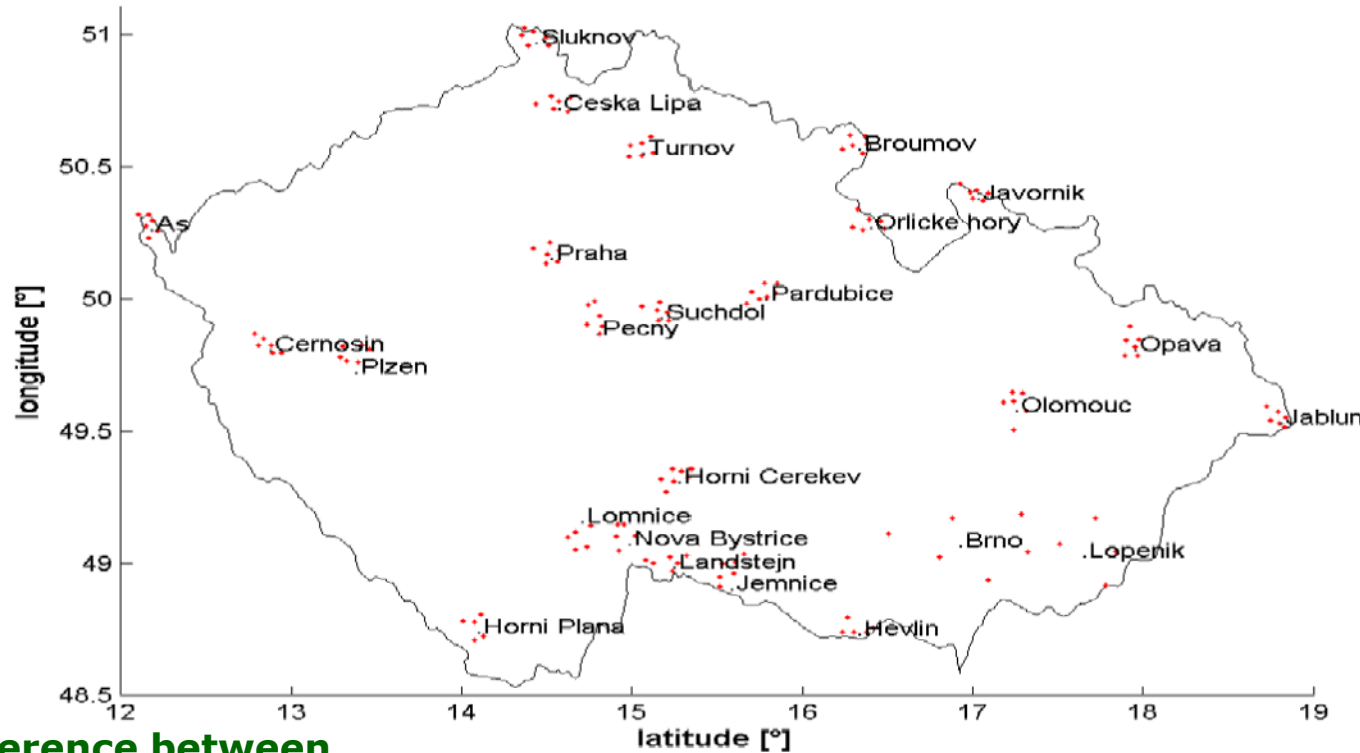
Jan Řezníček, Prague 2016

Quality Control of CZEPOS Network



Surveying Test of Accuracy (2006)

25 areas, 150 points



Mean Square Error – difference between measured and given coordinates

<i>service</i>	<i>mxy</i> [cm]	<i>Mh</i> [cm]	<i>measuring</i> <i>time</i> [s]
DGPS	18	43	20 – 60
RTK-PRS	1,0	3,0	20 – 60
RTK-FKP	1,0	3,1	20 – 60
RTK	1,1	3,2	20 – 60

mxy – position square error
mh – height square error

Quality Control of CZEPOS Network



Surveying Test of Accuracy



Stability

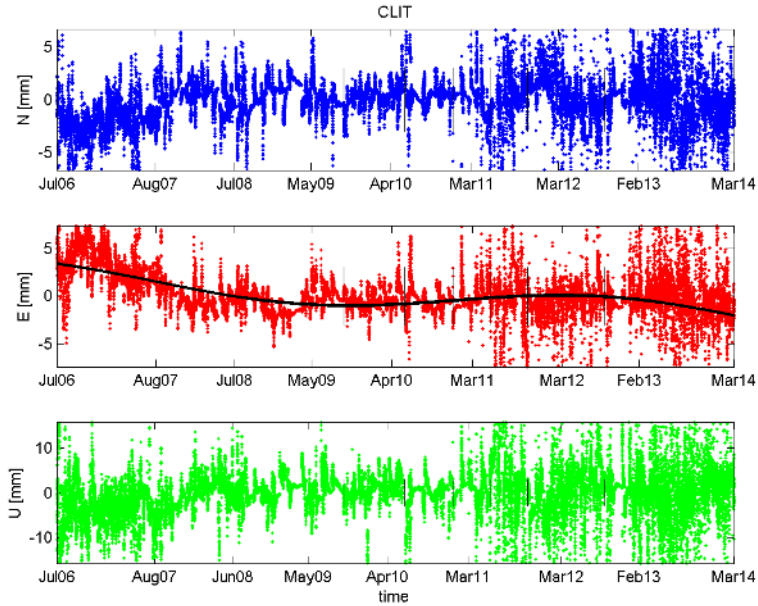
Availability of Network Solution

Accuracy of Network Solution

Quality of PostProcessing Files

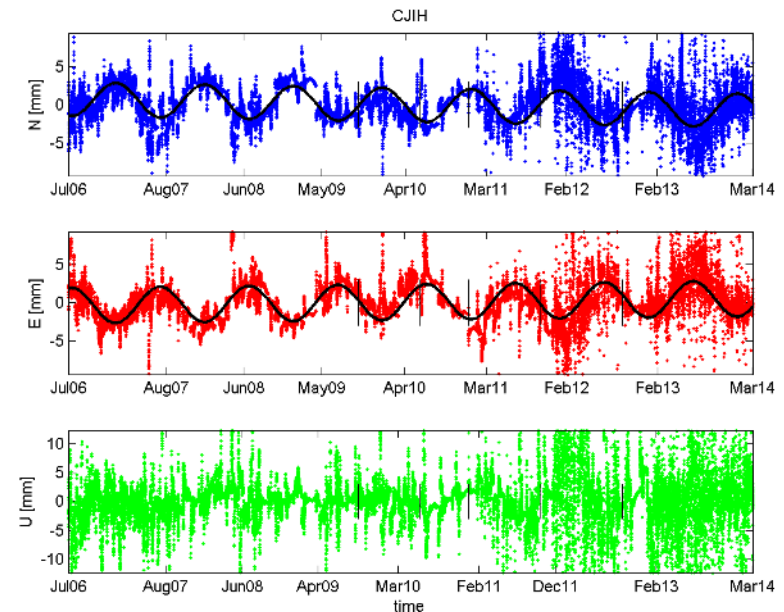
Availability of Services

Monitoring of Stability (from Network Solution)



Station	Amplitude		Period	
	[mm]		days	
	N	E	N	E
CJIH	2,2	2,3	365	365
CKAP		1,7		365
CPRG		1,0		365
CPRI		2,4		365
CSUM	1,0		365	
CTRU	1,5		365	
CVSE	1,1		365	
CHOD	1,0	1,8	365	365
CPRA	1,0	1,4	365	2350
CLIT		1,4		2495

spectral analysis applied in the north-south and east-west directions, regarding possible motion of some stations.
 Discovered linear or Periodical motion (bigger than 1mm/year, 1mm amplitude respectively).



Monitoring of Stability (GOP Analytic Centre)

Monitoring permanentních stanic GNSS - Windows Internet Explorer

http://oko.pecny.cz/monitor/#d

Monitoring permanentních stanic GNSS

Dočasné uživatelské rozhraní do doby, než bude služba umístěna na webu ČUZK

Statuty stanic a souřadnice pro konkrétní den | Aktuální ověřené souřadnice | Celkový přehled | Návoděda | Webová služba

Nahoru

1. Statuty stanic a souřadnic

Stav pro den 20.1.2015 (úterý) - poslední vypočtený den

Vybrat:

Statuty stanic a ověřené souřadnice

Výsledky pro síťová řešení (z ultra rapid řešení)

Síť	Výsledek
CZEPOS	CZEPOS : Síťové řešení ověřeno
TRIMBLE	Trimble VRS NOW : Síťové řešení neověřeno

Výsledky pro jednotlivé stanice z ultra rapid řešení

Stanice	Popis	B			L			H (ell.)	Status	Dráhy (*.sp3), komentář
CBUD	České Budějovice	48	58	3.47154	14	28	30.97608	456.223	Overeno	ultra rapid, vypocet OK
CDAC	Dačice	49	04	47.20485	15	26	12.45539	534.730	Overeno	ultra rapid, vypocet OK
CDOM	Domažlice	49	26	45.25334	12	55	26.77675	519.603	Overeno	ultra rapid, vypocet OK

Quality Control of CZEPOS Network



Surveying Test of Accuracy

Stability

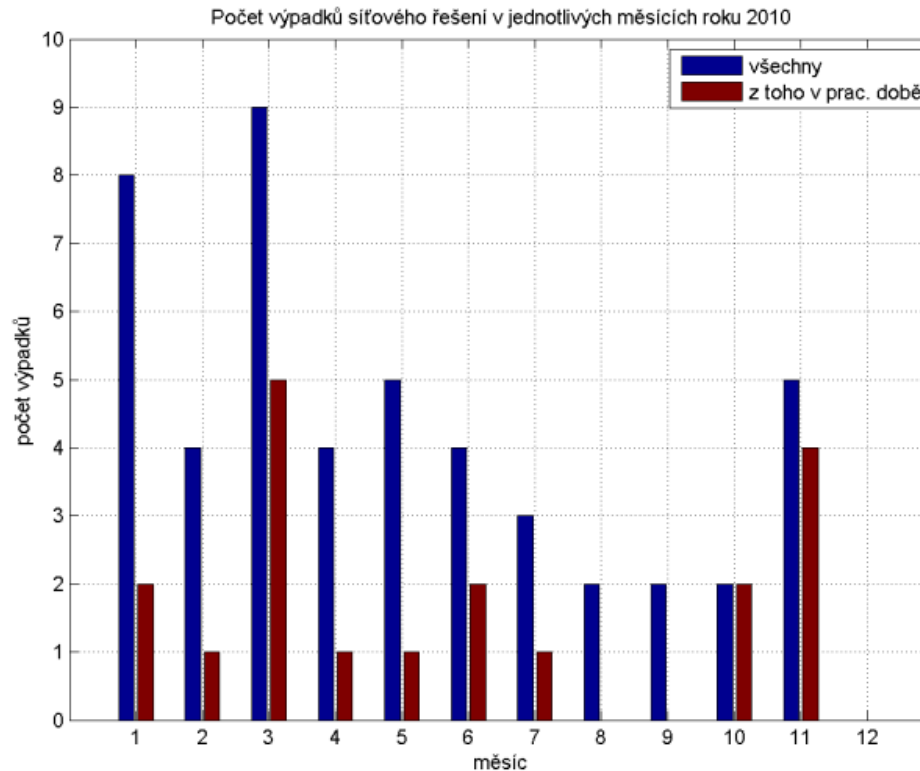
Availability of Network Solution

Accuracy of Network Solution

Quality of PostProcessing Files

Availability of Services

Monitoring of Availability of Network Solution



The network solution failures were detected by analysis of hourly changes of station coordinates and their mean square errors (computed from the network solution)

Quality Control of CZEPOS Network



Surveying Test of Accuracy

Stability

Availability of Network Solution

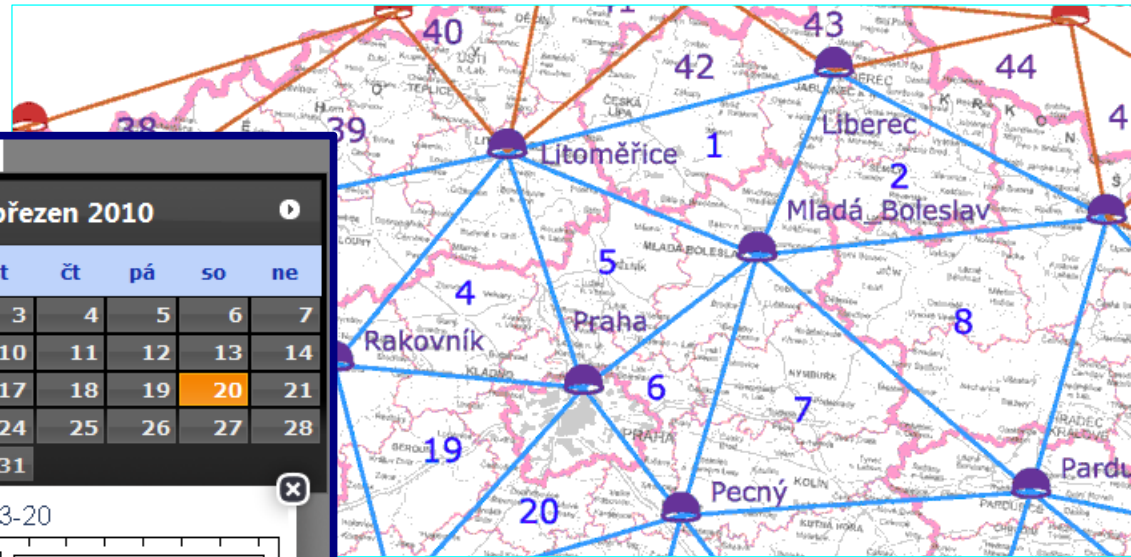
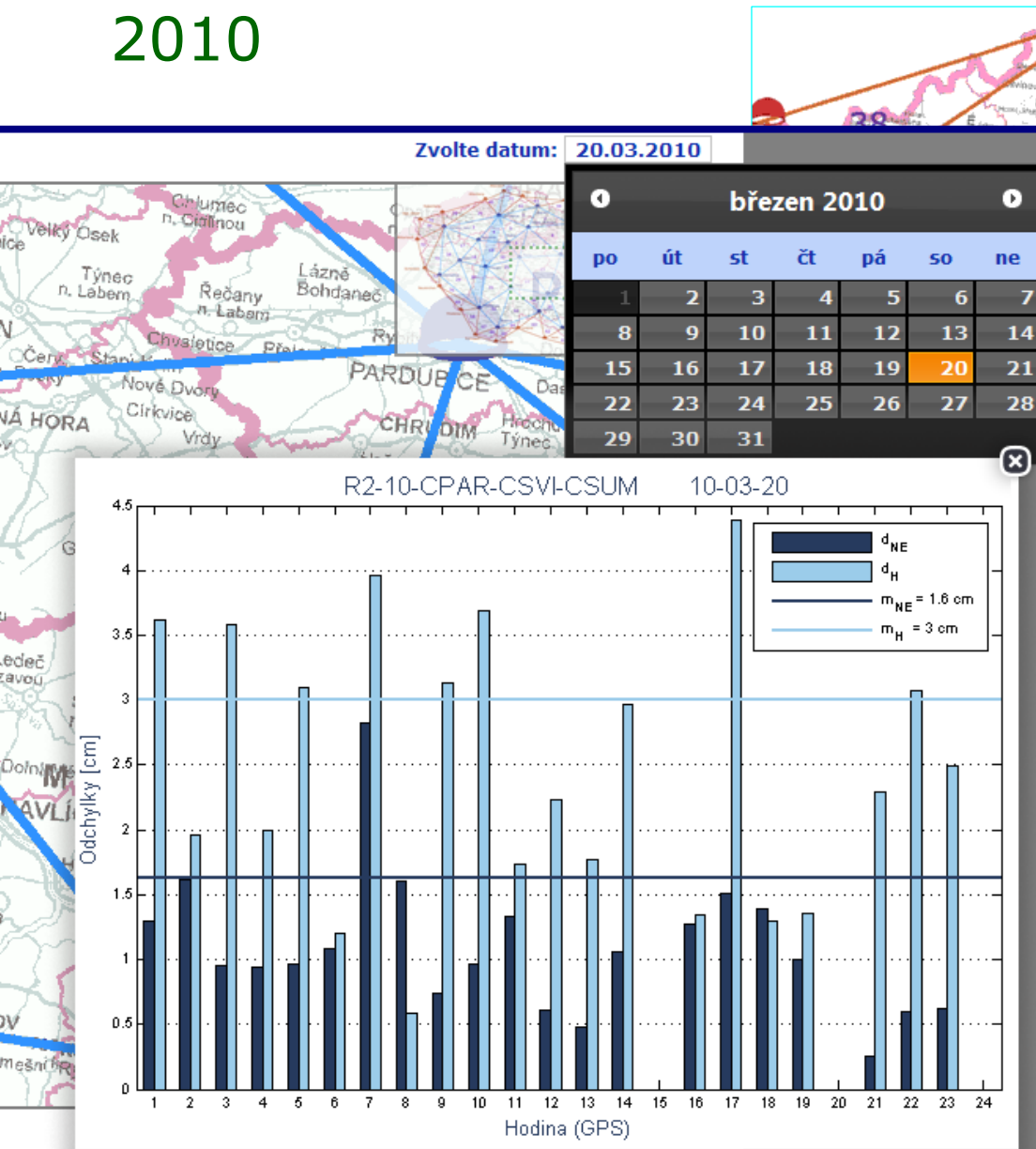
Accuracy of Network Solution

Quality of PostProcessing Files

Availability of Services

Monitoring of Accuracy of Network Solution

2010



- Internet application, created in cooperation with CTU
- 75 testing areas on the territory of CR including border areas
- there are 3 testing baselines in each area
- each baseline is tested from RTK x VRS service

Quality Control of CZEPOS Network

Surveying Test of Accuracy

Stability

Availability of Network Solution

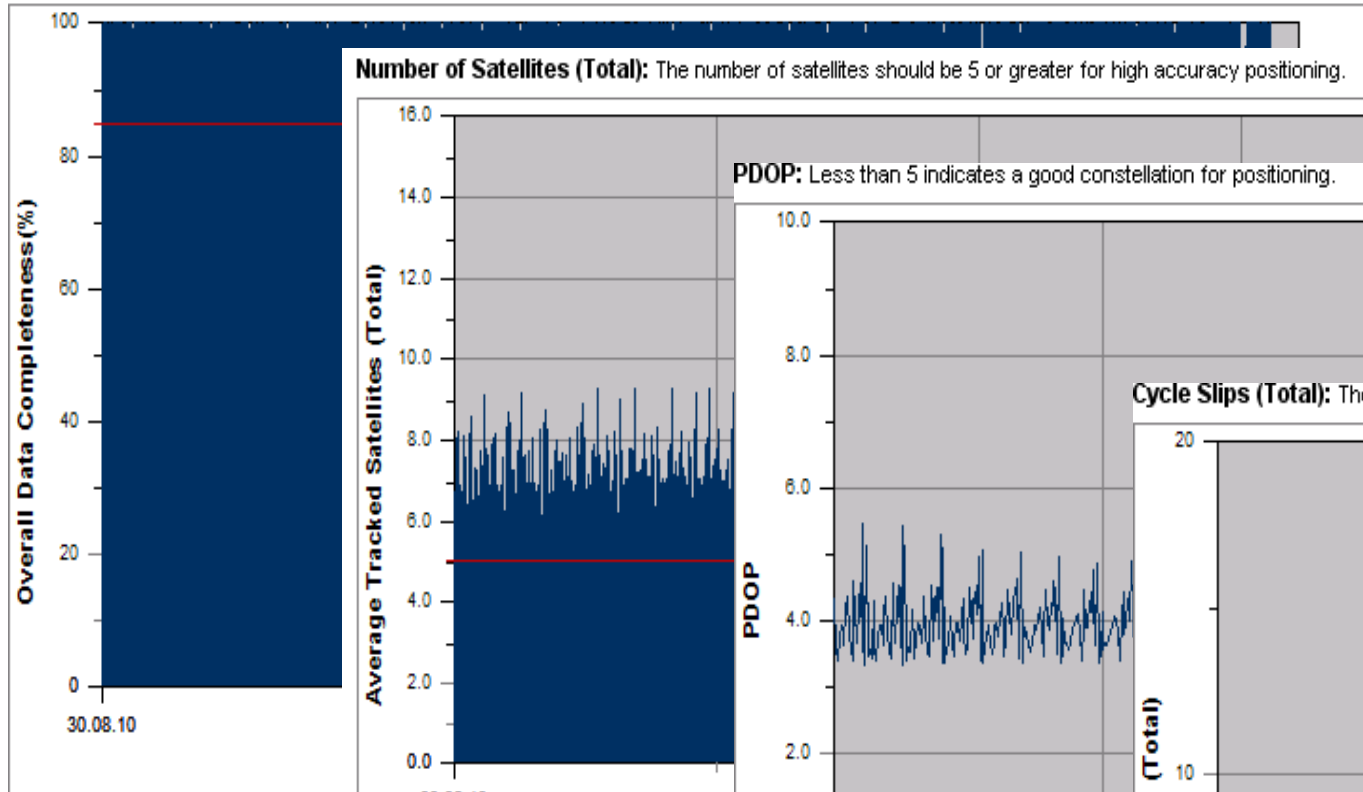
Accuracy of Network Solution

Quality of PostProcessing Files

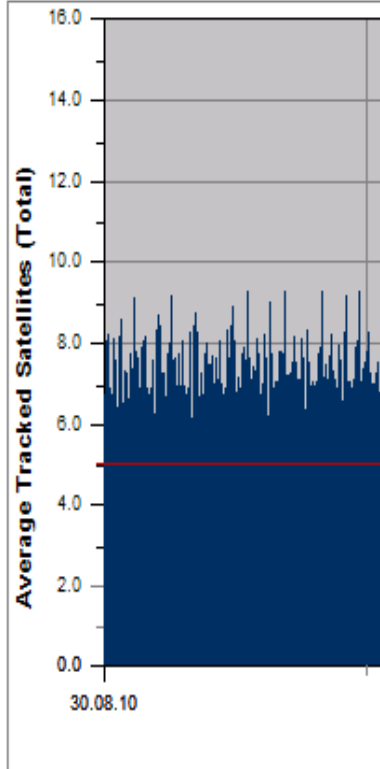
Availability of Services

Monitoring of Quality of RINEX Files

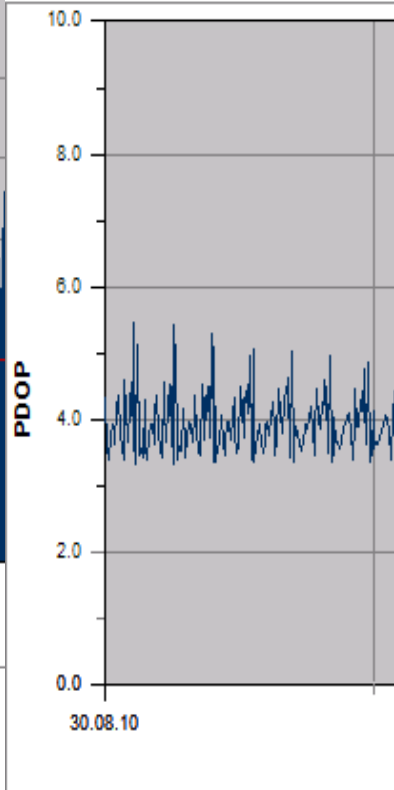
Overall Data Completeness: More than 84% complete epochs/observations indicates normal operation.



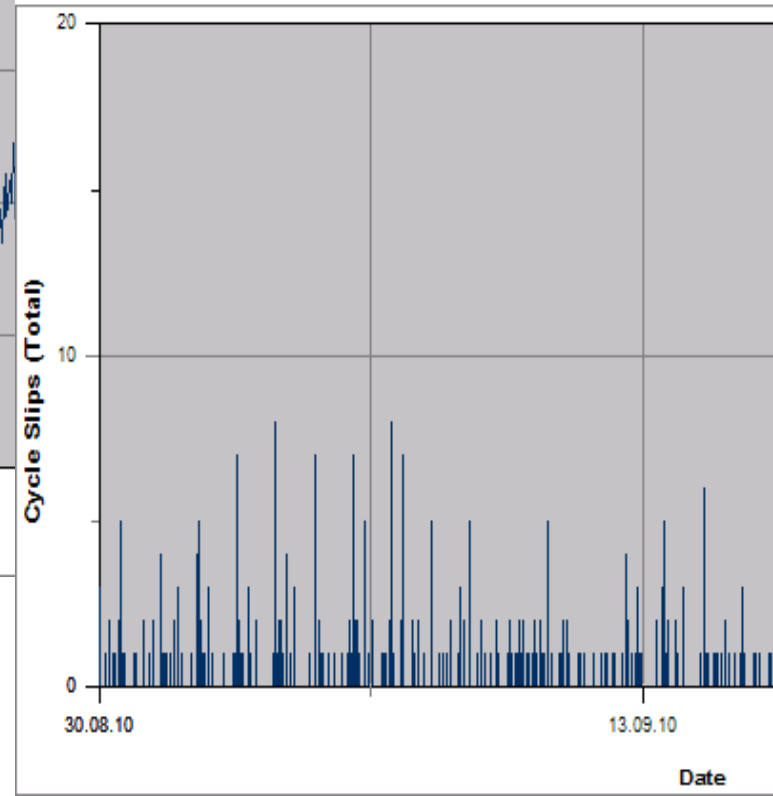
Number of Satellites (Total): The number of satellites should be 5 or greater for high accuracy positioning.



PDOP: Less than 5 indicates a good constellation for positioning.



Cycle Slips (Total): The number of cycle slips detected.



Quality Control of CZEPOS Network



Surveying Test of Accuracy

Stability

Availability of Network Solution

Accuracy of Network Solution

Quality of PostProcessing Files

Availability of Services

Monitoring of Availability of Services

ZEMĚŘECKÝ ÚŘAD - CZEPOS - Mozilla Firefox

Soubor Úpravy Zobrazení Historie Záložky Oblíbené Nástroje Nápověda

ZEMĚŘECKÝ ÚŘAD - ...

czepos.cuzk.cz/_serviceStatus.aspx

aktuální stav služeb RTK a DGPS
služby RTK a DGPS, závislé na výběru stanice

n	stanice	kód	RTK funkční	DGPS funkční	testováno
1	Pardubice	CPAR	ANO	ANO	7/17/2012 9:31:36 PM
2	Svitavy	CSVI	ANO	ANO	7/17/2012 9:33:04 PM
3	Jihlava	CJIH	NE	NE	7/17/2012 9:34:32 PM
4	Dačice	CDAC	ANO	ANO	7/17/2012 9:36:00 PM
5	Tábor	C			
6	Příbram	C			

výpis historie - služby virtuální referenční stanice a nejbližší stanice

- real time services

- actual status available in websites

- virtual reference station

- single station

vyperte službu: FKP zvolte datum: 17.07.2012

FKP
funkční

ANO

NE

17.7.01 17.7.02 17.7.03 17.7.04 17.7.05 17.7.06 17.7.07 17.7.08 17.7.09 17.7.10 17.7.11 17.7.12 17.7.13 17.7.14 17.7.15 17.7.16 17.7.17 17.7.18 17.7.19 17.7.20 17.7.21 17.7.22

http://czepos.cuzk...

Soubor Úpravy Zobrazit Oblíbené položky Nástroj >>

Oblíbené položky http://czepos.cuzk.cz/Obrs/...

n;stanice;kód;RTK funkční;DGPS funkční;testováno

14:Liberec;CLIB;ANO;ANO;1/6/2011 12:13:03 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 12:37:07 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 1:01:16 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 1:25:22 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 1:49:28 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 2:13:36 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 2:37:45 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 3:01:50 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 3:25:57 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 3:50:00 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 4:14:04 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 4:38:08 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 5:02:08 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 5:26:12 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 5:50:09 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 6:14:04 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 6:38:01 AM

14:Liberec;CLIB;NE;NE;1/6/2011 7:01:55 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 7:25:50 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 7:49:41 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 8:13:39 AM

14:Liberec;CLIB;ANO;ANO;1/6/2011 8:37:48 AM

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14:Liberec;CLIB;ANO;ANO;1/6/2011 11:26:26 AM

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14:Liberec;CLIB;ANO;ANO;1/6/2011 3:51:33 PM

14:Liberec;CLIB;ANO;ANO;1/6/2011 4:15:42 PM

Místní intranet 100%



thank you for your attention