







IDS Combined Solution: on the way to the ITRF2020

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Context

Evaluation of the IDS contribution to ITRF2014 (ids 09) wrt the IDS contribution to ITRF2008 (ids 03) revealed

- Worse performances in terms of station position residuals wrt ITRF2008 in the East direction mainly from 1993.0 to 2002.4.
- A degradation of the X and Y pole differences wrt IERS C04 series from 1993.0 to 2002.4.

Table 9

Main statistics of WRMS of the station residuals from IDS 03 (ITRF2008) and IDS 09 (ITRF2014) series. Unit is mm.

Series id.	Time span	East		North		Up		
		Mean	Std	Mean	Std	Mean	Std	
IDS 03	1993.0-2002.4	19.41	2.73	15.09	2.50	18.08	2.56	
IDS 03	2002.4-2008.5	12.97	1.89	10.25	1.94	12.81	1.96	
IDS 03	2008.5-2009.0	16.39	2.24	13.26	1.40	14.82	1.85	
IDS 09	1993.0-2002.4	25.19	4.78	15.78	3.23	19.95	3.86	
IDS 09	2002.4-2008.5	11.97	2.14	8.73	1.51	10.09	1.92	
IDS 09	2008.5-2015.0	9.14	1.23	7.18	1.17	8.05	1.19	

Source: Moreaux et al. (2016).

→ Origin of the degradation?

Table 7

Main statistics of polar motions from IDS 03 (ITRF2008) and IDS 09 (ITRF2014) series. Unit are µas and µas/yr.

Series id.	Time span	X-pole			Y-pole			
		Trend	Mean	Std	Trend	Mean	Std	
IDS 03	1993.0-2002.4	14.87	1.84	346.54	-2.91	-5.05	486.55	
IDS 03	2002.4-2008.5	-13.19	1.82	177.38	44.53	0.17	257.77	
IDS 03	2008.5-2009.0	-170.76	-1.06	159.65	193.12	1.60	239.32	
IDS 09	1993.0-2002.4	10.76	-0.05	685.08	45.95	0.71	624.04	
IDS 09	2002.4-2008.5	6.67	0.36	308.55	21.10	-0.26	292.93	
IDS 09	2008.5-2015.0	24.44	-0.43	244.74	5.79	-0.02	234.75	

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Source: Moreaux et al. (2016).



IDS Combined Series

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• IDS 03 = IDS contribution to ITRF2008

= esa 03 + gau 08 + gop 31 + gsc 10 + ign 08 + ina 03 + lca 24

• IDS 09 = IDS contribution to ITRF2014

= esa 10 + gop 43 + grg 40 + gsc 26 + ign 15 + ina 08

- IDS 12 = operational IDS combined series
 ≈ IDS 09 + all the ACs contribute to the EOPs and to the scale
 = esa 10 + gop 43/50 + grg 40/41 + gsc 29/32 + ign 15 + ina 10
- IDS 32 ≈ IDS 12 with new preprocessing and all ACs contribute to the EOPs
 = esa 10 + gop43 + grg40 + gsc26 + ign15 + ina10
- IDS 40 = IDS 32
 - + GOP does not contribute to the EOPs
 - + GRG is not included in the internal constraints on the rotations



- More stations (0-4) in the weekly SINEX files of IDS 12 as a direct consequence of less stringent pre-processing.
- IDS 32 and 40 have in overall one station more than IDS 03.



Helmert parameters wrt ITRF2014

- Excepted for the scale, the differences are smaller than the STD.
- Scale difference between IDS 03 and IDS 12/32/40 is due to the use of new phase laws for the new series (new IDS standard for the ITRF2014 processing).

IDS 03 - IDS 12 - IDS 32 - IDS 40





Station Position Residuals wrt ITRF2014

- For all the time periods, IDS 40 performs better than IDS 12.
- Excepted for the first time span (1993.0-19941), IDS 40 performs as well as IDS 03 on the three directions.

Time	Corios	North [mm]		East [mm]		Up [mm]		
Period	Series	Mean	Std	Mean	Std	Mean	Std	
	ids 03	16.9	2.4	21.4	2.7	20.1	2.3	
1993.0-	ids 12	19.6	3.8	29.9	5.7	24.5	5.0	
1994.1	ids 32	18.3	2.5	23.3	3.3	21.9	3.3	
	ids 40	18.4	2.5	23.0	3.6	21.7	3.5	
	ids 03	14.1	2.0	18.8	2.3	17.7	2.3	
1994.1- 1996.9	ids 12	14.6	2.4	23.9	3.8	18.9	3.0	
	ids 32	14.6	2.5	19.4	2.8	17.5	2.4	
	ids 40	14.5	2.5	18.9	2.7	17.2	2.5	
	ids 03	16.5	2.5	21.4	2.5	20.5	2.2	
1996.9- 1998.3	ids 12	18.1	4.5	28.9	4.6	23.1	4.0	
	ids 32	17.3	3.8	22.7	3.5	21.1	3.1	
	ids 40	17.4	3.9	21.9	3.4	20.5	3.0	Ξ
	ids 03	14.8	2.4	18.8	2.4	17.1	2.4	
1998.3-	ids 12	14.8	2.8	23.3	4.1	18.4	3.0	
2002.3	ids 32	14.5	2.3	18.8	2.9	16.6	2.3	
	ids 40	14.4	2.3	18.1	2.8	16.3	2.3	

IDS 03 – IDS 12 – IDS 32 – IDS 40









EOP differences wrt IERS C04

- IDS 32/40 perform as well as IDS 12.
- IDS 01 is still the best maybe because
 - i) It includes 2 mores AC (esa & gau) contributions.
 - ii) ESA was at that time the best EOP contributor.







- The new station selection criteria significantly improves the station position performance of the new IDS combined series without any impact on the Helmert parameters for a similar network compared to the IDS contribution to the ITRF2008.
- No impact of the new selection criteria on the EOP performances which are still not as good as IDS 03. May be due to a smaller number of contributors and the ESA performances.