#### EUROLAS Data Center (EDC) Improvements of the EDC-Website for the ILRS Community

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#### Overview

- State of the Art
- New features of the EDC-Website
- Conclusion/Outlook

					Impressum Si	temap Contact
EUROLAS Data Cel		International laser Ranging Services You are logged i Logout	n es: schwatke My Protie			
Home Data & Products Stations Satellites Statistics Operation Center (OC) Mail	ing Lists	Documents Tools	ILRS-Website	e (Mirror)		
Recent News	SL	R Live Tracking				
2013-10-28	La	test Normal Points	(CRD)			
The status of station Mt.Stromio, Australia (7825) was changed to quarantine.		Incoming Date	Satellite	Station	Start Data Date	Ago
2013-10-24		2013-11-04 10:10:26	Jason2	Hartebeesthoek	2013-11-04 05:47:52	22 min
The status of station McDonald, USA (7080) was channed to validated		2013-11-04 10:10:26	ajisat	Hortebeesthoek	2013-11-04 05:43:12	22 min
The states of states, secondary, our (roud) was changed to variable.		2013-11-04 10:10:26	lageos2	Hartebeesthack	2013-11-04 05:32:25	22 min
2013-10-23		2013-11-04 10:10:26	stariette	Hortebeesthoek	2013-11-04 05:18:46	22 min
The status of station Wettzell, Germany (8834) was changed to quarantine.		2013-11-04 10:10:26	gracea	Hartebeesthaek	2013-11-04 05:08:07	22 min
		2013-11-04 09:36:25	compassi5	Graz	2013-11-02 14:04:00	56 min
2013-10-11		2013-11-04 09:36:25	cryosot2	Graz	2013-11-02 23:44:32	56 min
The status of station Riga, Latvia (1884) was changed to quarantine.		2013-11-04 09:36:25	beacone	Graz	2013-11-02 23:22:48	56 min
2013-08-21		2013-11-04 09:36:25	lares	Graz	2013-11-02 23:15:12	56 min
The status of station McDonald, USA (7080) was channed to suscepting		2013-11-04 09:36:25	lageost	Graz	2013-11-02 23:10:00	56 min
The states of states According, use (road) was changed to que arcsite.						[more]
2013-06-17	La	test Full-Rate (CRD	))			
The status of station Haleakala, Hawaii (7119) was changed to validated.	J 🗖	Incoming Date	Satellite	Station	Start Data Date	Ago
2013-04-19		2013-11-04 09:54:23	terrasarx	Matera	2013-11-03 15:51:29	38 min
The status of station Haleakala, Hawaii (7119) was changed to quarantine.	- 1	2013-11-04 09:54:23	starlette	Matera	2013-11-03 18:05:27	38 min
The seases of seases, herearding, herear (s 113) has changed to que altitle.		2012 11 04 00:54:22	storlatta	Hatara	2012 11 02 10 51 02	20 min



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Screenshoot of the EDC-Website

# The Website

- EDC-Website was launched on 2011-11-15
- URL: http://edc.dgfi.badw.de
- Current features of the EDC-Website:
  - Information about submitted SLR data (normal point data, fullrate data), predictions and products
  - Data sets in CRD, CPF, CSTG and MERIT-II format are managed
  - Detailed information about all stations and satellites
  - Stations can track the EDC data flow and the current status of their submitted data
  - Information about each submitted data set can be retrieved
  - Information on how the Operation Center (OC) checks all submitted data sets



# **CRD-Check**

- Online tool for checking CRD data (NPT, FRD) for format errors
- Users can upload their data for checking them via web interface
- Target groups are
  - station managers of new stations
  - stations after software updates

Select C	RD file
F	lename: Durchsuchen Upload & Check
	check as single pass file (only one H4 and H8 record allowed)
Uploadii	g and Checking CRD file 7237_glonass123_crd_20131103_10_04.npt
There w	as no error found.
Record	pecific error(s)/warning(s):
1	H1 CRD 1 2013 11 4 0
2	H2 CHAL 7237 19 01 4
3	H3 glonass123 1004102 9123 37138 0 1
4	H4 1 2013 11 3 10 53 58 2013 11 3 10 56 44 4 0 0 0 1 0 2 0
5	C0 0 532.000 STD CL1 CD1 CT1
6	C1 0 CL1 RG30-L 1064.00 1000.00 1.50 10.0 92.82 0
7	C2 0 CD1 CSPAD 532.000 20.00 5.0 60.0 TTL 0.0 1.70 0.0 0.0 none
8	C3 0 CT1 Meridian Meridian ET-A033 na 0.0
9	60 std 6 1
10	40 37200.00000000000 0 std 4175 3507 3.699 179847.0 0.0 61.4 0.000 0.000 0.0 2 0 0
11	20 39407.00000000000 988.90 280.10 82. 0
12	11 39279.028001006016 0.135324854957 std 2 300.0 571 118.7 0.058 -0.532 287.1 0.0 0
13	11 39350.110001000648 0.135186812622 std 2 300.0 1505 120.9 0.045 -0.496 285.1 0.0 0
14	JO SLU 120.0 0.040 -0.504 209.5 0
15	HQ
10	112
17	

Select C	RD file									
Fi	Durchsuchen Upload & Check									
	$\Box$ check as single pass file (only one H4 and H8 record allowed)									
Jploading and Checking CRD file 7237_glonass106_crd_20131103_20_00.npt										
<b>T</b> heorem		man formal								
inere w	ere z er	rors touna.								
Record s	specific	error(s)/warning(s):								
1	H1 CRD 1	2013 11 4 0								
2	H2 CHAL	7237 19 01 4								
3	H3 glona	ss100 705501 106 32275 0 1								
	EH3002 -	Target name, Satellite ID and SIC ID are not from the same satellite.								
	EH3031 -	Satellite Id was not found.								
4	H4 1 201	3 11 3 20 20 14 2013 11 3 20 24 33 0 0 0 0 1 0 2 0								
5	C0 0 532	.000 STD CL1 CD1 CT1								
6	C1 0 CL1	RG30-L 1064.00 1000.00 1.50 10.0 92.82 0								
7	C2 0 CD1	CSPAD 532.000 20.00 5.0 60.0 TTL 0.0 1.70 0.0 0.0 none								
8	C3 0 CT1	Meridian Meridian ET-A033 na 0.0								
9	60 std 6	1								
10	40 73620	.00000000000 0 std 3778 2871 3.699 179682.0 0.0 65.4 0.000 0.000 0.0 2 0 0								
11	20 73476	.0000000000 993.10 274.40 92. 0								
12	11 73354	.858000994951 0.130773626435 std 2 300.0 326 126.1 0.101 -0.378 297.5 0.0 0								
13	50 std 1	25.0 0.119 -0.376 298.3 0								
14	H8									
15	H9									
16										



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Example of CRD-Check of a valid data set

Example of CRD-Check of a data set with errors

### **CPF-Check**

- Online tool for checking predictions (CPF) for format errors
- Users can upload their data for checking them via web interface
- Target groups are
  - prediction providers updating their software
  - prediction providers creating predictions for new satellites

Select CPF file										
Filename	: Durchsuchen Upload & Ch	ieck								
Uploading and Checking CPF file										
There wa	as no error found.									
Record s	specific error(s)/warning(s):									
1	H1 CPF 1 HTS 2013 11 3 12 8051 jason2 NONE									
2	H2 0803201 1025 33105 2013 11 03 0 0 0 2013 11 08 0 0 0 240 1 1	001								
3	Н9									
4	10 0 56598 85200.00000 0 -4433270.553 6150717.539 1439246.948									
5	10 0 56598 85440.00000 0 -4963744.383 5908090.753 -127335.720									
6	10 0 56598 85680.00000 0 -5261889.456 5387533.007 -1687563.880									
7	10 0 56598 85920.00000 0 -5322442.428 4606656.415 -3163597.788									
8	10 0 56598 86160.00000 0 -5151142.203 3596018.199 -4481890.643									
9	10 0 56599 0.00000 0 -4763967.365 2397903.414 -5576889.896									
10	10 0 56599 240.00000 0 -4185901.769 1064498.898 -6394279.676									
11	10 0 56599 480.00000 0 -3449333.963 -344436.947 -6893613.539									
12	10 0 56599 720.00000 0 -2592204.505 -1764288.963 -7050234.137									
13	10 0 56599 960.00000 0 -1656018.216 -3128557.110 -6856420.448									
14	10 0 56599 1200.00000 0 -683824.294 -4371968.765 -6321744.342									
15	10 0 56599 1440.00000 0 281754.635 -5433616.017 -5472627.886									
16	10 0 56599 1680.00000 0 1200373.021 -6259986.910 -4351106.632									

Select C	Select CPF file									
Filename	Durchsuchen Upload & Check									
Uploadin	Jploading and Checking CPF file									
There w	There were 2 errors found.									
Record :	Record specific error(s)/warning(s):									
1	H1 CPF 1 ESA 2013 11 2 9 8061 galileo104									
2	H 1203502 104 38858 2013 13 2 0 0 0 2013 11 7 0 0 0 900 1 1 0 0 0									
	EH2021 - Satellite id is not valid.									
	EH2061 - Starting Month is not valid.									
3	Н9									
4	10 0 56598 0.000000 0 972746.765 -16892587.062 24285116.794									
5	10 0 56598 900.000000 0 3155141.706 -16683864.230 24243782.299									
6	10 0 56598 1800.000000 0 5329383.391 -16625531.492 23900898.922									
7	10 0 56598 2700.000000 0 7458187.263 -16714539.785 23260727.748									
8	10 0 56598 3600.000000 0 9505434.749 -16941814.638 22331227.034									
9	10 0 56598 4500.000000 0 11437239.968 -17292553.536 21123953.667									
10	10 0 56598 5400.000000 0 13222947.316 -17746705.672 19653919.906									
11	10 0 56598 6300.000000 0 14836028.822 -18279619.058 17939407.142									
12	10 0 56598 7200.000000 0 16254853.282 -18862834.718 16001738.911									
13	10 0 56598 8100.000000 0 17463303.175 -19465003.067 13865015.941									

Example of CPF-Check of a data set with errors



### **User-defined CPF-Mailer**

- Recipients of the CPF-mailer will receive the latest predictions submitted to the EDC
- The user-defined CPF-mailer enables users to configure the CPF-mailer individually
- CPF predictions can be selected by
  - satellite
  - prediction provider
- The existing CPF-mailer maintained by the EDC will be migrated to the user-defined CPF-mailer
- All recipients of the former CPF-mailer will be requested in the near future to register for the new user-defined CPF-mailer



#### **Statistics**

- Monthly and yearly EDC reports are available for download since 2012/05
- Content of reports:
  - Daily/monthly/yearly number of observations/files/passages for satellites and stations
  - Daily number of predictions for satellites
  - Yearly number of predictions for prediction centers
  - Status of the stations
  - Time-delay from measurement to the data center
  - etc.
- Most statistics are also available on the EDC-Website





#### SLR Mailing Lists

		×			Impressum Sitemap Contae
		EUROLAS	Data Center (EDC)		International laser trauping Service
		20 Martin			You are logged in as: schwatke
me Da	ata & Products	Stations Satellites Statistics Operation C	enter (OC) Mailing Lists Documents Tools ILRS-Website (Mirro	r)	
LR-M	lail Archiv	e 0 2009 2008 2007 2006 2005 2004 2003 2002	2001 2000 1999 1998 1997 1996 1995		Search in SLR-Mail Archive Mail No.
Nov	Date	Sender	Subject		Date
2205	2013-10-23	Chris Moore <cmoore@eos-aus.com></cmoore@eos-aus.com>	[SLR-Mail] No.2205: Mt Stromlo Upgrade	[more]	
2204	2013-10-21	Hiroo Kunimori <kuni@rrict.go.jp></kuni@rrict.go.jp>	[SLR-Matt] No.2204: ICS052014	[more]	Sender
2203	2013-10-22	Günther Herold <herold@fs.wettzell.de></herold@fs.wettzell.de>	[SLR-Mati] No.2203: WLRS upgrade	[more]	
2202	2013-10-21	Carey Noll «Carey:Nollignasa.gov»	[SLR-Mail] No.2202: Planning for the 19th International Workshop on Laser Ranging	[more]	Subject
2201	2013-10-17	Bianco Giuseppe <giuseppe.bianco@asi.it></giuseppe.bianco@asi.it>	[SLR-Mail] No.2201: Upcoming EUROLAS Meeting in Japan	[more]	Author
2200	2013-10-16	Woo, Justine - IS <justine.woo@exeltisinc.com></justine.woo@exeltisinc.com>	[SLR-Matt] No.2200: Stpsat-2 Campaign is Over	[more]	
2199	2013-10-11	Kalvis Salmin <kalvis@lanet.lv></kalvis@lanet.lv>	[SLR-Matl] No.2199: SLR Riga 1884 maintenance and upgrade	[more]	Content
2198	2013-10-10	Tonie VAN DAM «tonie.vandam@uni.lu»	[SLR:Mail] No.2198: REFAG2014	[more]	
2197	2013-09-30	Carey Noll «Carey Nollignasa.gov»	[SLR:Mail] No.2197: Possible CDDIS outage due to U.S. Government furlough	[more]	AND OR
2196	2013-09-20	John Antine If a battine Stan Transferration and	[SLR-Mail] No.2196: Greenbelt (7105) down for scheduled maintenance	(march)	Search



2013-09-19

2013-09-09

2013-08-25

2195

2193

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- SLR-Mails and SLR-Reports are now stored in a database
- Both archives are accessible via the EDC-Website and FTP

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#### SLR Mailing Lists

	00				_
3	0	EUROLA	S Data Center (EDC)		International laser Ranging Service
000					You are logged in as
ie Da	ala & Product	s Stations Satellites Statistics Operatio	n Center (OC) Mailing Lists Documents Tools TLRS-Website (Mirror	0	
013 20 resul	012 2011 20. t(s) found!	10 2009 2008 2007 2006 2005 2004 2003 2 1	002 2001 2000 1999 1998 1997 1996 1995		Search in SLR-Mail Archive Mail No.
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713 20 resul Not 2192	012 2011 20. t(s) found! Date 2013-08-22	2009 2008 2007 2006 2005 2004 2003 2	002 2001 2000 1999 1998 1997 1996 1995 Subject [SLR-Mail] No.2192: Power Outage at EDC	[more]	Search in SLR-Mail Archive Mail No.
213 20 resul Not 2192 2090	22 2011 20. t(s) found! Date 2013-08-22 2012-05-30	2009 2008 2007 2006 2005 2004 2003 2 Sender Christian Schwatke <schwatke@dgfi.badw.de> Christian Schwatke <schwatke@dgfi.badw.de></schwatke@dgfi.badw.de></schwatke@dgfi.badw.de>	002 2001 2000 1999 1998 1997 1996 1995  Subject [SLR-Mail] No.2192: Power Outage at EDC [SLR-Mail] No.2090: Stop sending CSTG data to the DCs	[mov e]	Search in SLR-Mail Archive Mail No. Date Sender
013 20 resul 2192 2090 2027	D12 2011 20: t(s) found! Date 2013-08-22 2012-05-30 2011-11-24	20 2009 2008 2007 2006 2005 2004 2003 2 Sender Christian Schwatke «schwatke@dgfi.badw.de» Christian Schwatke «schwatke@dgfi.badw.de» Christian Schwatke «schwatke@dgfi.badw.de»	Subject         Subject           [SLR-Mail] No.2192: Power Outage at EDC         [SLR-Mail] No.2090: Stop sending CSTG data to the DCs           [SLR-Mail] No.2027: Change of the FTP structure at EDC	[more] [more]	Search in SLR-Mail Archive Mail No. Date Sender Schwatke
013 20 resul Nof 2192 2090 2027 2024	Date 2013-08-22 2013-08-22 2012-05-30 2011-11-24 2011-10-25	Sender         Christian Schwatke «schwatke@dgfi.badw.de»	002 2001 2000 1999 1998 1997 1996 1995         Subject         [SLR-Mail] No.2192: Power Outage at EDC         [SLR-Mail] No.2090: Stop sending CSTG data to the DCs         [SLR-Mail] No.2027: Change of the FTP structure at EDC         [SLR-Mail] No.20227: Change of the FTP structure at EDC         [SLR-Mail] No.20227: Change of the FTP structure at EDC         [SLR-Mail] No.20227: Change of the FTP structure at EDC	[more] [more] [more]	Search in SLR-Mail Archive Mail No. Date Sender Schwatke Subject
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Nof 2192 2090 2027 2024 1971 1921 1918	Date 2013-08-22 2013-08-22 2012-05-30 2011-11-24 2011-10-25 2011-03-11 2010-10-25 2010-10-07	Sender         Christian Schwatke «schwatke@dgfi.badw.de»	OO2 2001 2000 1999 1998 1997 1996 1995         Subject         [SLR-Mail] No.2192: Power Outage at EDC         [SLR-Mail] No.2090: Stop sending CSTG data to the DCs         [SLR-Mail] No.2027: Change of the FTP structure at EDC         [SLR-Mail] No.2027: Change of the FTP structure at EDC         [SLR-Mail] No.2024: Two open positions at DGP1 Munich         [SLR-Mail] No. 1971: 7080 MDOL: Missing MLRS data         [SLR-Mail] No. 1921: Power outage at EDC on October 29th, 2010         [SLR-Mail] No. 1918: RE: No.1908 : Transition to new EDC server environment	[more] [more] [more] [more] [more] [more] [more]	Search in SLR-Mail Archive Mail No. Date Sender Sender Schwatke Subject
No2           2192           2090           2027           2024           1971           1921           1918           1911	22 2011 200 t(s) found! Date 2013-08-22 2012-05-30 2011-11-24 2011-0-25 2010-10-25 2010-10-07 2010-09-21	20       2009       2008       2007       2006       2005       2004       2003       2         20       2009       2008       2007       2006       2005       2004       2003       2         20       Sender       Christian Schwatke       Schwatke@dgfi.badw.de>       Schwatke@	Subject         [SLR-Mail] No.2192: Power Outage at EDC         [SLR-Mail] No.2090: Stop sending CSTG data to the DCs         [SLR-Mail] No.2027: Change of the FTP structure at EDC         [SLR-Mail] No.2027: Change of the FTP structure at EDC         [SLR-Mail] No.2024: Two open positions at DGF1 Munich         [SLR-Mail] No.1971: 7080 MDOL: Missing MLRS data         [SLR-Mail] No.1921: Power outage at EDC on October 29th, 2010         [SLR-Mail] No.1918: RE: No.1908 : Transition to new EDC server environment         [SLR-Mail] No.1911: Information to the transition of the new EDC server environment	[more] [more] [more] [more] [more] [more] [more] [more]	Search in SLR-Mail Archive Mail No. Date Sender Sender Schwatke Subject Author

- New search function for searching the archives
- Search criteria: mail no., date, sender, subject, author and content



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# EDC-API

- EUROLAS Data Center Application Programming Interface (EDC-API)
- The EDC-API allows users to access the EDC data holding by using their own programs via socket connections
- The user can send queries to the EDC data holding and receive userdefined database listings





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### EDC-API

- Communication using the EDC-API occurs in two steps (authentication, database query)
- The authentication occurs by sending an API-key which is available after registration on the EDC website
- The database request contains parameters for the database selection (e.g. data type, output parameters, constraints for the selection, ...)
- The database response contains an array with all datasets returned by the database selection





#### EDC-API

- First application using the EDC-API is the "Station Monitor"
- The "Station Monitor" lists the latest submitted data sets of a certain station and updates itself automatically
- The program can be downloaded from the EDC-Website
- The Source code (Python) can be modified for other applications

8	8												
   	Incoming	Date		Station	 	Satellite		Start Data Date		End Data Date		Status	
	2013-11- 2013-11- 2013-11- 2013-11- 2013-11- 2013-11- 2013-11- 2013-11- 2013-11- 2013-11- 2013-11- 2013-10- 2013-10- 2013-10- 2013-10- 2013-10- 2013-10-	03 04:10:52 03 03:11:12 03 03:11:12 03 01:10:12 03 00:10:51 03 00:10:51 02 21:10:11 01 04:10:37 01 03:10:22 01 02:10:21 01 00:11:17 01 00:11:17 01 00:11:17 01 00:11:17 01 00:11:17 01 02:10:36 30 16:14:32 30 16:14:32 30 16:14:32		70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419 70802419		7501001   1104301   8606101   1107101   1200601   7603901   7603901   0304206   8606101   1200601   1200601   1200601   1200601   9306102   8606101   8606101   7501001		2013-11-03 00:38:10 2013-11-03 00:17:18 2013-11-02 23:38:36 2013-11-02 22:18:37 2013-11-02 20:58:55 2013-11-02 20:47:24 2013-11-02 17:24:48 2013-11-01 00:28:50 2013-10-31 23:28:16 2013-10-31 23:28:16 2013-10-31 21:15:31 2013-10-31 21:09:13 2013-10-31 19:56:00 2013-10-31 19:29:48 2013-10-30 03:49:45 2013-10-30 03:13:45 2013-10-30 02:56:27		2013-11-03 00:39:19 2013-11-03 00:20:07 2013-11-02 23:46:03 2013-11-02 22:23:36 2013-11-02 21:02:49 2013-11-02 20:52:15 2013-11-02 17:29:41 2013-11-01 00:29:49 2013-10-31 23:31:02 2013-10-31 23:09:20 2013-10-31 21:25:12 2013-10-31 21:25:12 2013-10-31 21:10:23 2013-10-31 21:10:23 2013-10-31 19:30:08 2013-10-30 03:56:40 2013-10-30 03:01:32		valid valid valid valid valid valid valid valid valid valid valid valid valid valid valid valid	
   	2013-10- 2013-10- 2013-10-	30 16:14:32 30 16:14:32 30 16:14:32 30 16:14:32	   	70802419 70802419 70802419	   	6503201   9207002   9207002		2013-10-30 01:58:13 2013-10-30 01:04:23 2013-10-27 02:33:22	   	2013-10-30 02:01:45 2013-10-30 01:36:36 2013-10-27 03:16:50	   	valid valid valid	



# Conclusion / Outlook

#### Conclusion

- The new tools
  - help station operators to track their data more efficient
  - help analysts to get more information about the data holding
  - help users to find information they are looking for (SLR Mail, etc.)

#### Outlook

- The functionality of the EDC-API will be improved (in collaboration with stations)
- Provide more statistics about the data holding (suggestions of interesting statistics are welcome)
- Internal near real time data processing (decrease of the time from the data submission to the availability of the data on FTP).
- Reorganization of the incoming FTP structure (one FTP account for each station, prediction center, etc.)



CGE• Stop sending data in old format (CSTG, MERIT-II) data to DCs. <sup>13</sup>