Industrial CSAMT



Multi Dipole CSAMT



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Present Situation I





DONG Hao, WEI Wenbo, YE Gaofeng, presented Darwin 2012



Present Situation II





Weißflog J., Eckhofer, F. et.al, TU Bergakademie Freiberg, presented Darwin 2012



Grid Layout Regular



A regular grid layout was used formerly because computer were using regularized grids





Grid Layout - Variable



Adaptive grids will find there optimum structure depending on conductivity contrasts







h

mlx esp 7/23/100, bir mlval / matext 0.9/2000; surface is: 14.2556 - 74.7724



Summary I



The design of the survey mesh follows

- Depth
- 2 or 3 dimensionality
- Expected conductivity contrast
- Available computer power
- Available inversion software



Available Sensors







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Data Acquisition



Automatized recording schemes – same data for each site / node

	_	- your mousely
	M	anagement
	0	DB Maintenance
	¹	View Jobtable
÷	Jo	blists
	📳	Select/Create
	E	Edit
	l 🛊	Import/Export
Į	ტ si	nutdown

L⊭ System History

lob Managen	nent				
New Jobname	e (tx_s			
	Ado	l Job		Delete All Job	S
Joblist conter	nts				
Start-time	Stop-time	Jobname	Update	Open for Edit	Delete
2012-03-21 00:00:00	2012-03-21 00:17:04	emap_8Hz_64s_64s	Update Job	Edit Job	Delete Job
2012-03-21 00:18:00	2012-03-21 00:30:48	emap_16Hz_64s_64s	Update Job	Edit Job	Delete Job
2012-03-21 00:32:00	2012-03-21 00:42:40	emap_32Hz_64s_64s	Update Job	Edit Job	Delete Job
2012-03-21 00:44:00	2012-03-21 00:54:40	emap_64Hz_64s_64s	Update Job	Edit Job	Delete Job



Pre-configured Processing



geop	TONIX Se hysics Re ADU-General	ADU-8	Time: 12:27:03 GPS: G4Fix -	/ 2012-07-19 fully synced	Batte Disks	ry: GOOD :pace: 28%		
Startpage Start Job	Site configuration	on		Site numbe	er configur	ation		
Stop Job	Line Number	1		ADU S	Site Numb	ber		
Event Job Processing queue	Run Number	[17		ADU-8	136			
Site config	Header Name	anhui		Optional Tr	ansmitter	Information		
Options Load/Save	Client	institute		Base Frequ	uency	1 Hz		
Shutdown	Contractor	[Dipole TX T	- Fime	1 s		
	Area	province		Number of	Dipoles	2 🗸		
	Survey ID	iron		Waveform I	Name	DefaultRect		
	Operator	bfr						
	Weather			Optional ProcMT Information				
	Comment			Processing	js sta	14096, trsh_09, trsh08		



Execute Processing

job lists



pre-configured processing





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Parallelized Processing





n processings, n-1 ring buffers



Results for TCSMT





3 dipoles result in 9 tensors, 6 dipoles in 18 tensors



Input Structure







ProcMT Structure



C			Jobs	۰ ×
>- Site_100	7	â	proc all	
>- Site_100	8			
>- Site_100	9			
>- Site_101	0			
🖣 🖌 Site_101	1			
🔰 🧹 Fri Ju	n 1 06:35:00 2012 5min, 2048Hz, 5 Channels			
>- 🖌 Fri Ju	n 1 06:41:00 2012 15min, 512Hz, 5 Channels			
>- 🖌 Fri Ju	n 1 06:57:00 2012 15min, 65536Hz, 5 Channels	U		
>- 🗸 Fri Ju	n 1 07:13:00 2012 22h, 128Hz, 5 Channels			
>- 🗐 Site_101	2	~		
Processing	Comment	1		
🖌 jet	jet 1024			
🖌 jet1024	jet 1024			
🔲 jet4096	jet 4096			
jet4096_3	jet 4096	_		
mtstd_new1	024 mtstd 1024			
		10-000		
Create Job		Run Job		



Storage & Access



Data Container



Database

Access SQL ↔ Java/C++/PHP ↔ HTML



Database Structure







Database Access I



Ý- 🧾 Site 99	Site 99	N 39:01:34.308 E 29:07:26.232
- Coherency Threshold		
🕌 📃 Median Processing		
→-	Processed: Tue Aug 21 16:17:18 2012	Acquired: Fri Aug 21 07:01:00 2009
>- 📃 mtstd_new4096	Processed: Tue Aug 21 16:17:18 2012	Acquired: Thu Aug 20 13:22:02 2009
>- 📃 mtstd_new4096	Processed: Tue Aug 21 16:17:18 2012	Acquired: Thu Aug 20 13:22:00 2009
v- 📃 mtstd_new4096	Processed: Thu Aug 16 17:15:35 2012	Acquired: Fri Aug 21 07:01:00 2009
— 🛄 12 Hz	Tensor ID 3341	
— 📃 15 Hz	Tensor ID 3342	
— 📃 22 Hz	Tensor ID 3343	
— 📃 30 Hz	Tensor ID 3344	
— 📃 40 Hz	Tensor ID 3345	
— 🔲 57 Hz	Tensor ID 3346	
— 🦲 74 Hz	Tensor ID 3347	



Database Access II



SELECT site, result, processing, start, stop

FROM sites, results, processings

WHERE site = "Beijing" OR "WuHan"

AND processing = "robust"

AND start = "2012-09-14" AND stop = "2012-09-15";



Database Access III







The New TXM-22







Modern User Interface



<u>D</u> evice <u>J</u> obs <u>S</u> ite System <u>E</u> ditors <u>W</u> indow <u>H</u> elp									
Control 🖻 🗷	Control 🛛 🗷 Start/Stop Time Status								
(1)		Hour	Minute	Second	Date	O Power S	stage Output Idle		
	Start	12	27	12	2011-08-08	Joblist A	Active		
	Stop	12	57	12	2011-08-08	- System Status - Current U	0.0036 A		
U	Selec	t Waveform			Current V	0.0047 A			
							-0.0083 A		
		MTX_FREE_1	0.00097656	25 Hz P1: 4.82582e-317 °		DC Voltage	11.51 V		
						Temperature	30.56 °C		
Ē	- Cycliv	100			Free Disk Spac	e 6472.28 MByte			
	Cyciit	, 500				GPS Status			
		_				Latitude N 2	0°25′ 1.938"		
		Granularity			seconds	Longitude 🛙 7	7°44′32.172″		
			<u></u>		Altitude 23.	.3 m			
					_	Num Sats 9			
		Start Now Submit			Add to Joblist	Fix Status No	Fix		
					,	Time 12:	27:12		
Goto		Stop All Jobs	Stop Cur	rent Job		Date 201	1-08-08		







Horizontal and vertical current flows



Model by M. Becken, R. Streich, O. Ritter (Univ. Potsdam & GFZ Potsdam)



TXM-22 Rotation







2D Interpretation







2.5 D Interpretation







Summary II



- The interpretation software for multi grid measurements is available
- The recoding schemes are changing from "hand made" to automatized job lists
- Time series processing becomes parallelized
- Time series processing becomes automatized
- The huge amount of results will be stored in SQL database instead of the file system.
- Using databases instead of files allows multiple users to access the data at the same time
- Databases also allow direct Internet publishing

