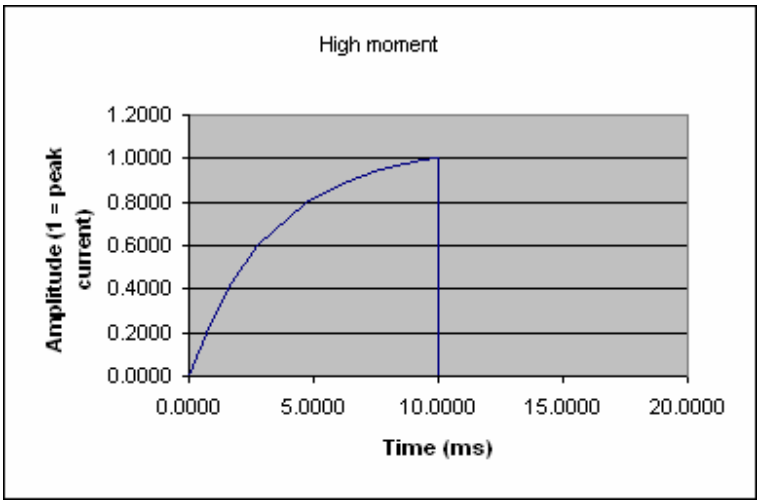
1. EM System specifications

EM Transmitter	
Transmitter loop area	313.98 m^2
Number of transmitter loop turns	4
Peak current	95 A
Peak moment	119,320 nAI
Tx loop height (nominal)	30 m
Tx Waveform	
Tx duty cycle	50%
Tx waveform	Bipolar
Tx on-time	10 ms
Tx off time	10 ms
Tx ramp time	46 μs
EM Receiver	
EM Sensors	dB/dt coils
Rx coil effective area (Z and X)	31.4 m^2
Low pass cut-off frequency for Rx coils	450 kHz
Low pass cut-off frequency for X-component Rx electronics	106 kHz
Low pass cut off frequency for Z component Rx electronics	225 kHz
Z-component Rx coil position	
Behind Tx loop centre	12.43 m
Above plane of Tx loop	2.22 m
X-component Rx coil position	
Behind Tx loop centre	13.81
Above plane of Tx loop	0 m

Waveform

Time (ms)	Amplitude (0 – 1)
0.0000	0.0000
0.7100	0.2000
1.5900	0.4000
2.7400	0.6000
4.7200	0.8000
6.3800	0.9000
7.6700	0.9500
9.3800	0.9900
10.0000	1.0000
10.0436	0.0153
10.0446	0.0057
10.0456	0.0000
20.0000	0.0000



Channel times

LM = low moment

HM = high moment

Channel #	Centre (us)	Start (us)	Width (us)	
2	11.80	10.10	3.70	LM
3	18.10	16.50	3.70	
4	24.60	22.90	3.70	
5	31.00	29.30	3.70	
6	37.40	35.70	3.70	
7	47.00	41.90	10.10	HM
8	59.80	54.70	10.10	
9	72.60	67.50	10.10	
10	88.60	80.30	16.50	
11	111.80	101.00	21.30	
12	145.40	130.00	30.60	
13	185.20	166.00	33.40	
14	234.40	210.00	47.00	
15	295.20	264.00	56.60	
16	370.60	331.00	79.00	
17	464.40	415.00	97.80	
18	581.40	519.00	122.00	
19	727.80	649.00	158.00	
20	911.20	812.00	194.00	
21	1117.00	1020.00	246.00	LM
22	1429.20	1270.00	310.00	

23	1791.20	1590.00	393.00	
24	2246.00	2000.00	502.00	
25	2817.40	2500.00	629.00	
26	3535.60	3140.00	792.00	
27	4438.80	3940.00	997.00	
28	5575.00	4940.00	1260.00	
29	7000.00	6210.00	1590.00	
30	8800.00	7800.00	2000.00	HM

Only channels whose start times occur after the end of the Tx ramp contain valid data. The first useable channel for this survey is Channel 8 (ramp 46 microseconds).

2. Ancillary instrument specifications

Ancillary instrument specifications

RTK DGPS	
SPS code	GP2
Model	Novatel DL-V3
RTK corrections	Omnistar HP
Cycle rate	1 Hz
Height datum	AHD
DGPS (and base station)	
SPS code	GP1
Model	UBlox RCB-LJ 16-channel Antaris
Antenna	Trimble Bullet III
Post processing	Base station
Cycle rate	1 Hz
Laser altimeters	
SPS codes	HE1, HE2
Model	LASER ACE models IM3R (type 150 or 300) or IM3HR (type 150 or 300)
Accuracy	0.2 m
Recording rate	0.2 s
Units	metres
Tiltmeters	

SPS code	TL1
Type	Accelerometer
Manufacturer	Bjerre Technology, Denmark
Measured quantity	Tilt of Tx frame from horizontal in flight direction (X) and orthogonal to flight direction (Y) (not pitch and roll)
Sign convention	X: Nose up +ve Y: Starboard side up +ve
Units	Degrees
Fundamental accuracy	< 1 degree
Resolution	0.1 degrees
Recording rate	0.5 s

3. Data files

Processed data

EM voltages have been normalised by receiver area (31.4 m^2) and peak current (~100 A) to yield units of nV/Am^2. As described above, only channels 8 – 30 contain valid EM data, as channels 1-7 are located within the transmitter switch-off ramp.

The *.XYZ file format is as follows:

Column 1 Line number (integer)

Column 2 Fiducial

Column 3 Date (YYYYMMDD) and flight number, e.g., 20070921_Flight02. Note that all date and time stamps are GMT.

Column 4 DateTime. Digital time since 1st January 1900.

Column 5 Angle X. Inclination of transmitter frame from horizontal in the in-line direction. Nose up +ve. Units: degrees.

Column 6 Angle Y. Inclination of transmitter frame from horizontal in direction perpendicular to the flight direction. Starboard side up +ve. Units: degrees.

Column 7 Terrain clearance from laser altimeters (m). Heights < 2 m and > 250 m are ignored during processing

Column 8 Digital terrain model. Datum AHD. Calculated by subtracting laser altitude (column 7) from GPS elevation (column 13)

Column 9 Peak transmitter current (Amperes). Measured immediately prior to the start of the turn-off ramp.

Column 10 Total magnetic intensity (nT) – not used for this survey.

Column 11 Northing (MGA53/GDA94)

Column 12 Easting (MGA53/GDA94)

Column 13 GPS elevation of transmitter loop (metres, AHD).

Column 14 Ground speed in km/h

Column 15 Z component EM data at channel 1. Units: nV/Am^2

⋮

Column 44 Z-component EM data at channel 30. Units: nV/Am^2

Column 45 X component EM data at channel 1. Units: nV/Am^2

⋮

Column 74 X component data at channel 30. Units: nV/Am^2