

GIF Utility Code: **LODI**



UBC - Geophysical Inversion Facility 1988 – 2014

Overview

The program `lodi` takes a DIGHEM-like data file and produces a file appropriate for input to program `EM1DFM`. The parameters for the data in each column are specified in a control file. Lines beginning with a slash (/) in the columns file are treated as comments and are ignored. DIGHEM data files are formatted with the data for each sounding location on a single line of the file and with each column a datum at a different frequency or transmitter-receiver combination. The usage for `lodi` is:

```
lodi [lodi.in]
```

where the control file must be named `lodi.in` and may or may not be included in the command line, but will still be read.

File specifications

`lodi.in`

The format of `lodi.in` is:

<code>obs</code>	!	input file
<code>outFile</code>	!	output file
<code>n</code>	!	number of columns in obs
<code>param1</code>	!	description of column 1
<code>:</code>	<code>:</code>	
<code>paramN</code>	!	description of column n
<code>grp, m</code>	!	which soundings to be considered

Parameter definitions:

obs Observations file

outFile Output file that will be formatted for **EM1DFM**

n Number of columns in the observations column

paramI Ith column description with one of the following inputs (either upper or lower case):

- **ignore**: ignores the column
- **x**: the x-coordinate of each sounding
- **y**: the y-coordinate of each sounding
- **z m|f**: the height of the transmitter-receiver pair and the coordinate system (**m** for metres or **f** for feet)
- **freq txOrient mom rxOrient unit trx try norm iq punc aunc**: line specifying transmitter and receiver where:
 - * **freq**: the frequency in Hz
 - * **txOrient**: either **x,y**, or **z** and is the orientation of the transmitter
 - * **mom**: the dipole moment of the transmitter
 - * **rxOrient**: either **x,y**, or **z** and is the receiver orientation
 - * **unit**: either **m** or **f** indicating the units (metres or feet) of the transmitter-receiver separation
 - * **trx**: the transmitter-receiver separation in the **x**-direction given in **unit** units
 - * **try**: the transmitter-receiver separation in the **y**-direction given in **unit** units
 - * **norm**: flag indicating the normalization of the data (same meaning of the values of this flag as for EM1DFM):
 - **1** secondary H-field normalized by the free space field and expressed in ppm
 - **2** secondary H-field normalized by the free space field and expressed in percent
 - **3** secondary H-field in A/m
 - **4** total H-field in A/m
 - * **iq**: indicates whether the datum is inphase (use **i**) or quadrature (use **q**)
 - * **punc**: the percentage uncertainty of the data in the column
 - * **aunc**: the minimum absolute uncertainty of the data in the column

grp,m : indicates the amount of decimation of the data and an integer number, where **grp** takes the form of

1. **al**: indicates that all the soundings are to be considered,
2. **av**: indicates that each group of 2^*m+1 soundings is to be averaged to give a new single sounding, or
3. **de**: indicates that the data are to be decimated down to every 1 in **m** soundings.

Examples

An example of lodi.in is

```
obs.xyz           ! input file
em1dfm.obs        ! output file
10                ! number of columns in obs.xyz
ignore           ! c1: ignore
x                ! c2: x coordinates
y                ! c3: y coordinates
z m              ! c4: heights in metres
900.  x 1.  x m 8.1 0.  1 i 5.  0.  ! c5: 900Hz, x-comp, inphase
900.  z 1.  z m 8.1 0.  1 i 5.  0.  ! c6: 900Hz, z-comp, inphase
5500. x 1.  x m 8.1 0.  1 q 5.  0.  ! c7: 5500Hz, x-comp, quad
7200. z 1.  z m 8.1 0.  1 i 5.  0.  ! c8: 7200Hz, z-comp, inphase
7200. z 1.  z m 8.1 0.  1 q 5.  0.  ! c9: 7200Hz, z-comp, quad
56000. z 1.  z m 8.1 0.  1 q 5.  0. ! c10: 56000Hz, z-comp, quad
de 2             ! Decimated to every 1 in 2 data points
```

An example of obs.xyz is

```
/ -----
/ XYZ EXPORT [02/29/01]
/ -----
/
/ fid      Easting      Northing    ALTR   CXI900   CPI900   CXQ5500   CPI7200   CPQ7200   CPQ56K
/ ===      =====
/
67920  473998.97  7318039.50  73.1   -3.57   -12.68   -0.53    -6.48    -0.18     4.64
67921  473995.28  7318039.00  72.7   -3.67   -13.42   -0.55    -6.90    -0.16     4.68
67922  473991.75  7318037.00  73.6   -3.72   -14.28   -0.55    -7.40    -0.12     4.76
67923  473988.13  7318036.50  74.3   -3.74   -15.18   -0.52    -7.98    -0.04     4.84
67924  473984.50  7318034.50  74.3   -3.74   -16.02   -0.47    -8.60     0.06     4.96
```