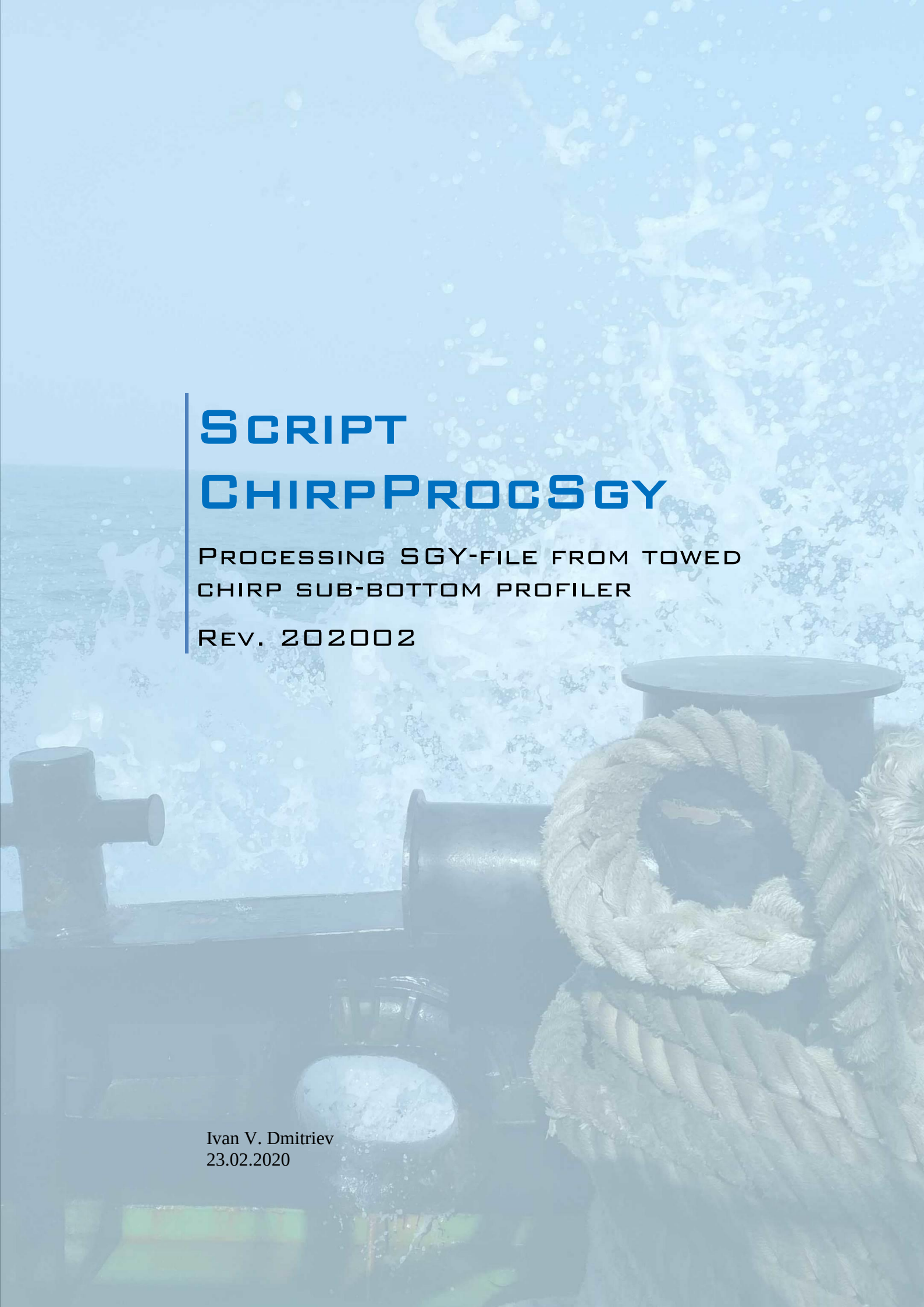

Script ChirpProcSgy

Processing SGY-file from towed chirp sub-bottom profiler

Rev. 202002

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Contents

Figures list

1 Overview and requirements

The Training03 document described SGY-file processing from towed (or mounted) chirp sub-bottom profiler (the EdgeTech 2000DSS chirp data example is used). The functions were tested in MatLab R2015b.

There will be need follow functions sets:

-- gSgy to read SGY-files in dataset variables,

-- gNav to create coordinates transformations,

-- gP190 to convert DTEN-fields to P190,

-- gAcad to write AutoCAD script-file,

-- gMap to draw track-plots in MatLab.

The gTraining03_ChirpProcSgy.m script can be used as example:
http://ge0mlib.com/g/gTraining03_ChirpProcSgy.zip

The follow Sgy-files are used as a survey data for gTraining02_SgyTexturalHeader.m:
http://ge0mlib.com/g/example/ET2000DSS_sgy.zip

There are follow tasks or processing steps:

-- Load Sgy-file and convert coordinates to planar ('SgyLoad' key).

-- Coordinates simplified processing, includes

a) manual track-plot de-spiking and linear interpolation for coordinates were repeat ('PositionRawDespike' key);

b) smooth track-plot ('PositionSmooth' key).

-- Bottom processing, includes

a) bottom and satellite-waves picking ('SBP_Pick' key);

b) current SBP-bottom creation using bottom-picking and satellite-waves-picking results with three methods ('SBP_BottomCreate' key);

c) current SBP-bottom shifting to MBES-bottom with two methods ('SBP_BottomToMBES' key and 'PtsLoad' for MBES-bottom loading).

-- Seismic traces processing, includes

a) traces muting above SBP-bottom;

b) traces cut below defined border (usually 2nd multiple);

c) traces gain;

d) traces de-noise.

-- Seismic traces saving to Syg-file with defined amplitude scale and DataSampleFormat.

2 Load Sgy-file and convert coordinates to planar

0) ==========

There are two sources of Sgy-variables:

-- file, characterized Name (includes Path and Extension);

-- PR-variable which includes a number of Survey Lines (Profiles) with different sensors (see description in 00_Ge0MLib_Beta.pdf).

In the first case we start script using file name

```
>> {'SgyLoad','d:\8\ET2000DSS_sgy\ET2000DSS_Line1.sgy'};gTraining03_ChirpProcSgy;
```

The script's lines 17 and 18 must be corrected to define Survey-datum and Projects-datum (see gNav.pdf; ***Figure 1***); the datum are used to calculate DTEN-fields. The datum examples:

```
NavS=struct('TargCode',2);
NavP=struct('EllipParam',[6378137 0.0818191908426215],'ProjParam',[0 57 0.9996 500000 0],
'ProjForvFunc','gNavGeog2ProjUtm','ProjRevFunc','gNavProjUtm2Geog','TargCode',6);
```

Survey (NavS) was made in geographic coordinates; the ellipsoid is not changed. Projects/script used planar coordinates with defined parameters for UTM-projection.

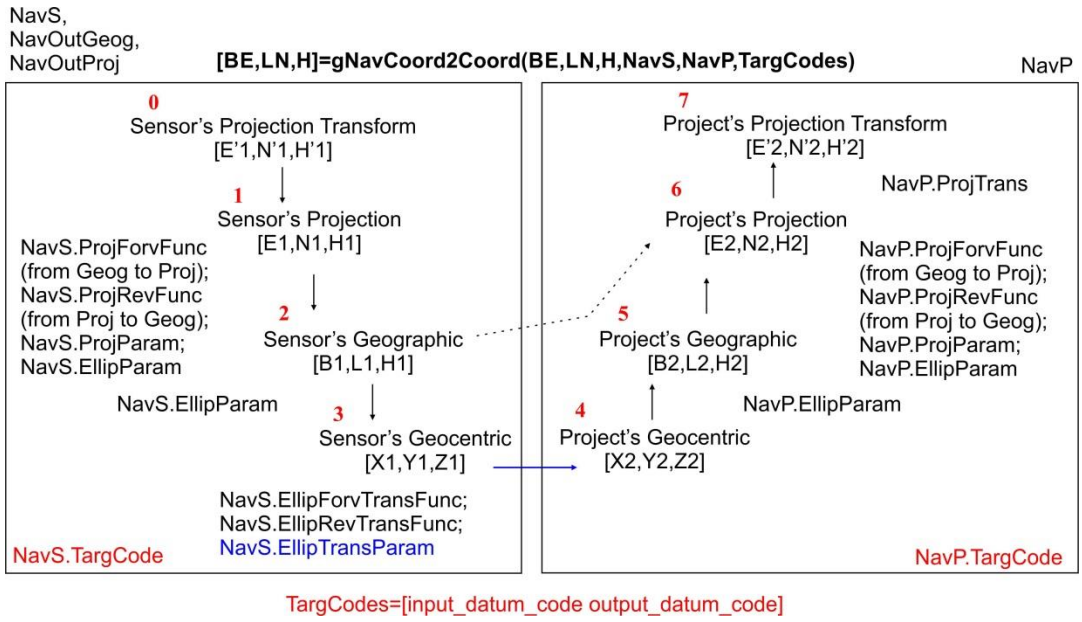

Figure 1 Coordinates re-calculation from ellipsoid_1 to ellipsoid_2 (red numbers are values for Nav.TargCode field)

In the second case we start script using Profile Number and Field-name (it is mean that PR-variable is presented in MatLab area)

```
>> {'SgyLoad',{2,'ET2000'}};gTraining03_ChirpProcSgy;
```

so, the SgyHead, Head and Data will read from PR{2}.ET2000.SgyHead, PR{2}.ET2000.Head and PR{2}.ET2000.Data (Survey Line number 2, field-name 'ET2000').

The Sgy-data contained in the variables SgyHead, Head and Data; the planar coordinates and time are contained in the Head's DTEN-fields (GpsKP, GpsDay, GpsTime, GpsE, GpsN, GpsH).

3 Coordinates simplified processing

1) ==========

Start the manual track-plot de-spiking and linear interpolation for coordinates to use

```
>> {'PositionRawDespike'};gTraining03_ChirpProcSgy;
```

(see gMap.pdf, Manual spikes piking for polyline)

Figure 2 Textural Header

Start script with folder name:

```
>> {'d:\8\ET3200SX512i\'};gTraining02_SgyTexturalHeader;
```

The follow parameters are update for each file:

StHead(08) – DAY-START OF REEL/LINE;

StHead(18) – SAMPLES/TRACE;

StHead(78) – LINE NAME (the name of file is used).

The Textural header convert to EBCDIC-code using gSgyTextAscii2Ebcdic function.

2) ==========

The Convert-folder was created (***Figure 3***).

Figure 3 SGY-files list with Textural Header was formed

The Textural Headers were changed for all files (***Figure 4***):

Figure 4 Textural Header was corrected

4 Bottom processing

5 Seismic traces processing

6 Seismic traces saving to Syg-file

Citation

1) gSgy // Ge0MLib (β) – Marine engineering geophysical data processing toolbox // 21.02.2020.