Zissou Essentials User Guide

Version 1.0
2019-07-09

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1 Introduction

This document is a guide to using Rockland Scientific's Zissou Essentials software. Zissou Essentials provides a user friendly solution for conversion of data to physical units, data inspection and basic data visualization. It is intended to quickly visualize the data to ensure that an instrument is performing as expected. This software is designed to open and process any Rockland binary data file (`p`-file).

Zissou Essentials (v1.0) is a Matlab based software, now a stand-alone package that can be used as an alternative to the Rockland Scientific ODAS Matlab Library (v4.3) for basic data inspection and visualization.

The software allows you to:

- Analyse bench test data collected with test probes
- Convert acquired data to physical units
- Visualize data for a customized range of interest
- Compute spectra for a segment of data and estimate the rate of dissipation for the chosen range.

To help you get started using Zissou Essentials, this user guide begins with two tutorials, processing data from a VMP (Section 2.1) and MicroRider (Section 2.2). Note that the software is linked with this user guide, therefore, you can press the buttons labelled "**?**" if present, or click on "**Help**" in the bar menu to access this documentation.

This user guide will focus on using the Zissou Essentials software and data inspection. For information about data processing, please refer to the Data Processing Manual.

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2 Tutorials

The following section provides a tutorial to get familiar with the software. A **Sample_Data** folder is available when downloading the Zissou Essentials software, which holds two data files (*VMP_024.p* and *DAT_059.p*) from a VMP-250 and a MicroRider-1000, respectively. The software tutorial will use both of those files to guide you through the features and functions of the software.

We assume, in this section, that you have already installed the software. If this is not the case, you can double-click on the executable installer and follow the instructions. For more details, please refer to Appendix A.

2.1 Vertical Microstructure Profiler

The first part of this tutorial presents a walk-through of typical data inspection and visualization within the Zissou Essentials software for vertical profiler. The data used for this tutorial was collected near Victoria, British Columbia, Canada using a Vertical Microstructure Profiler (VMP-250 in this case).

To get started, first open your software, ensure that the radio button "**Analyse Profile**" is selected and press the "**Select File**" button. Using the dialogue window, navigate to the location of the downloaded **Sample_Data** folder and open the *VMP_024.p* file. This will open the configuration string GUI (Figure 1).

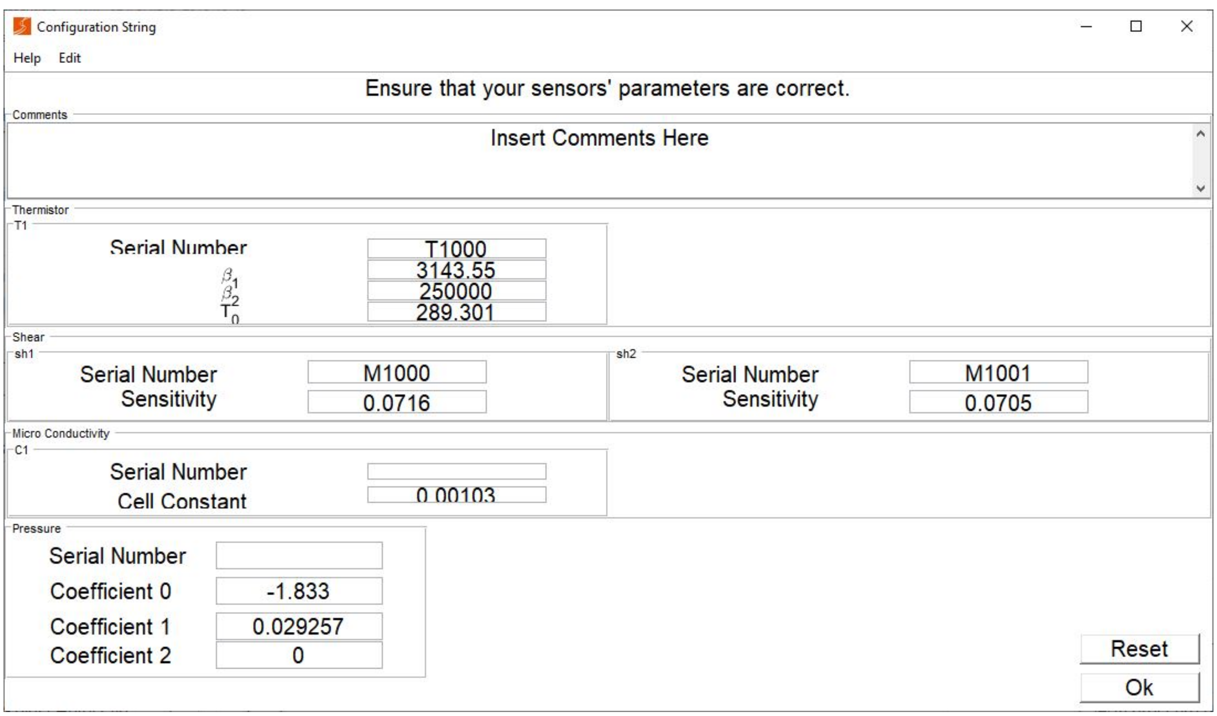

Figure 1: User interface presenting the partial content of the VMP's configuration file

When opening a file in Zissou, the software opens the configuration file editing tool. This tool highlights a subset of parameters used for the conversion of your data to physical units. This is meant as a reminder to update your calibration values when changing or re-calibrating a sensor on your instrument. **Press OK to proceed**. This will convert your sensor data to physical units.

You should now see in the main window, the time series of the pressure sensor as shown in Figure 2.

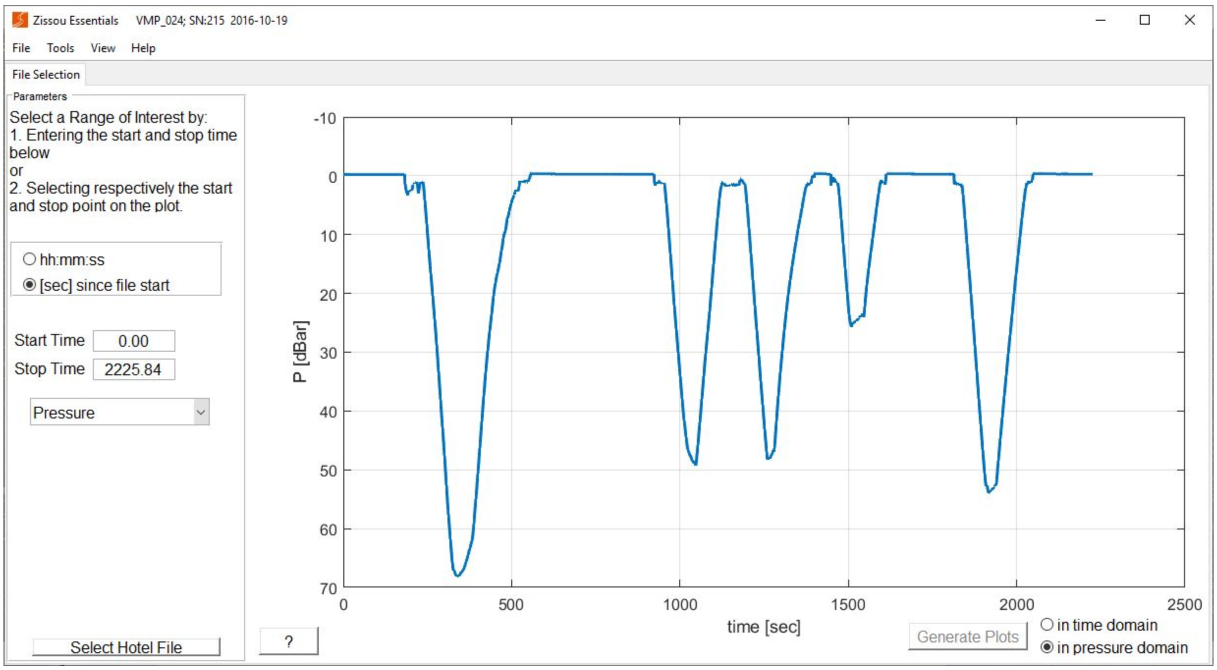

Figure 2: Initial display of sensor data to select a range of interest in your file

The scope of this tab is to let you select a range of interest within your data file. As is often the case, this data file includes multiple profiles. Zissou Essentials requires you to **choose one profile to move forward with processing.** This can be done in one of two ways:

- Manually change the start and stop time in the parameters panel on the left side of the window. This will highlight the selected region in red; or
- Select the time boundaries on the graph by clicking respectively at the start and stop points of your range of interest.

For this tutorial, the first profile is selected (see Figure 3). The software will highlight your selection in red.

Note that you are not limited to choosing your Range of Interest from the pressure sensor data. Use the drop-down menu in the left panel to select an alternative sensor to be plotted. Section 3.1 presents a description of the different elements of this display.

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NOTE: If one of the graph tools (the Zoom In tool for example) is selected, you will **not** be able to select your range of interest. Click on the tool icon again to unselect it.

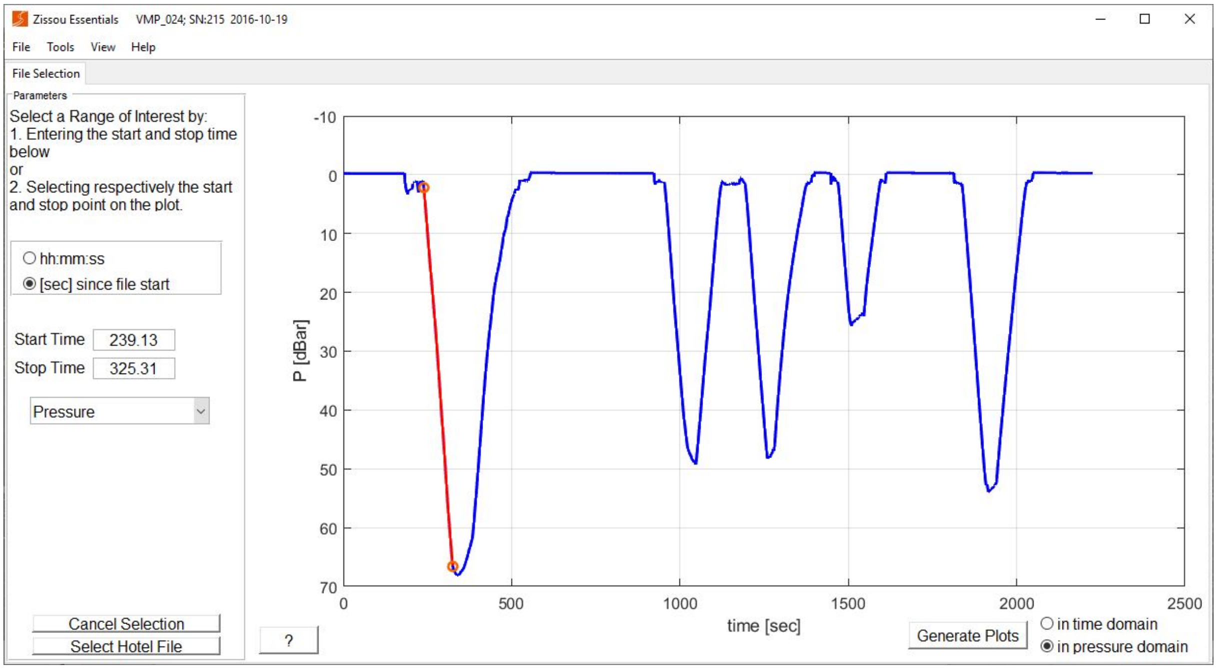

Figure 3: Display of the selected boundary for processing

Once the desired range has been selected, press the "**Generate Plots**" button. This generates a series of tabs displaying your data (Figures 4 – 7). Note that the data can be plotted either in the time or pressure domain. For vertical profilers, the software will default to displaying data in the pressure domain which provides a vertical rendering of your data.

For a detailed description and interpretation of the content of those panels, refer to your Data Processing Manual.

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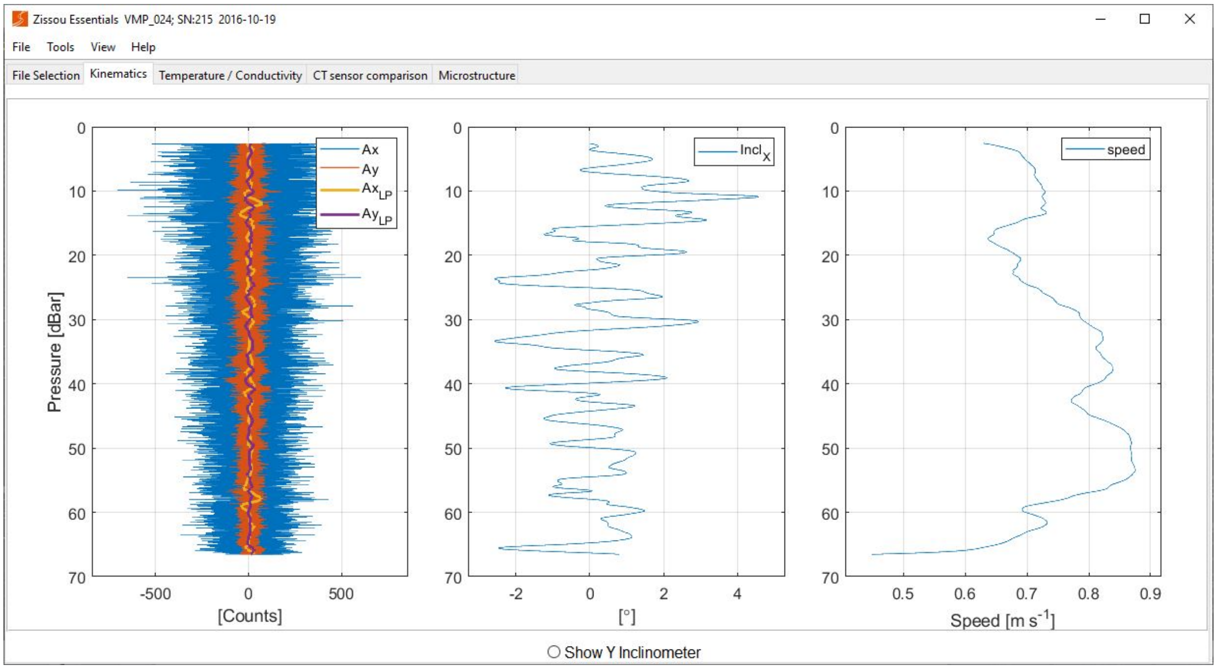

Figure 4: Figures presenting the kinematic data of your selected profile

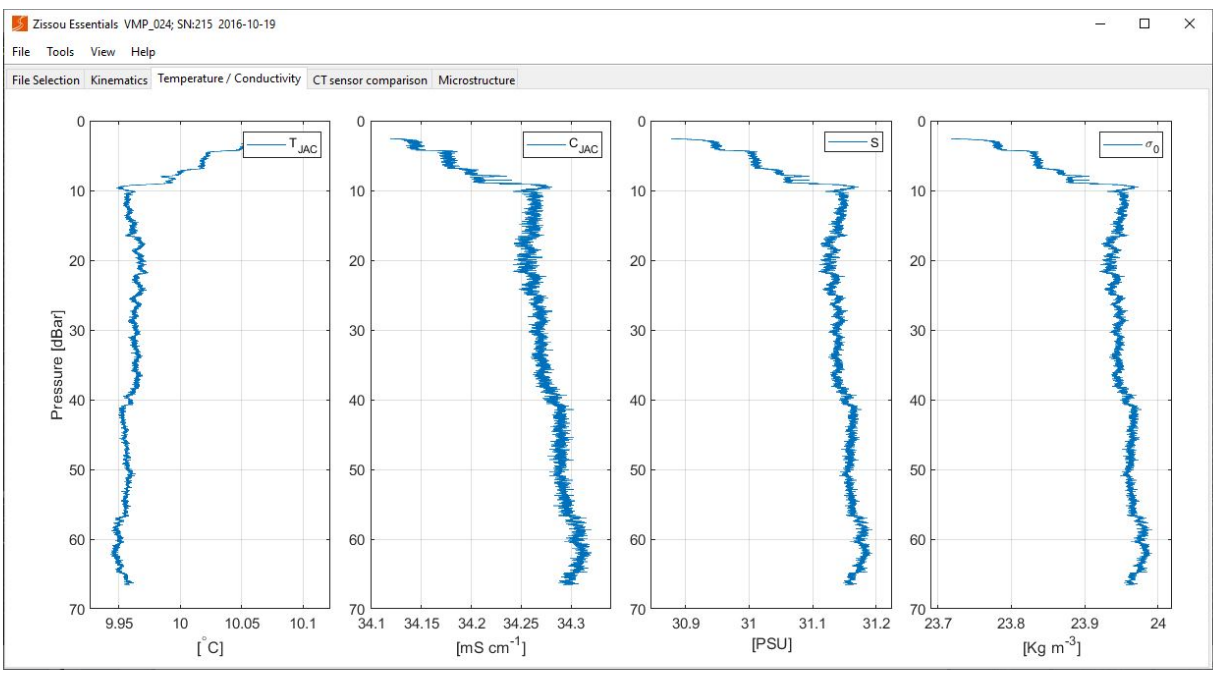

Figure 5: Figures presenting both the temperature and conductivity data of the JAC-CT sensor in addition to the calculated Salinity and potential density

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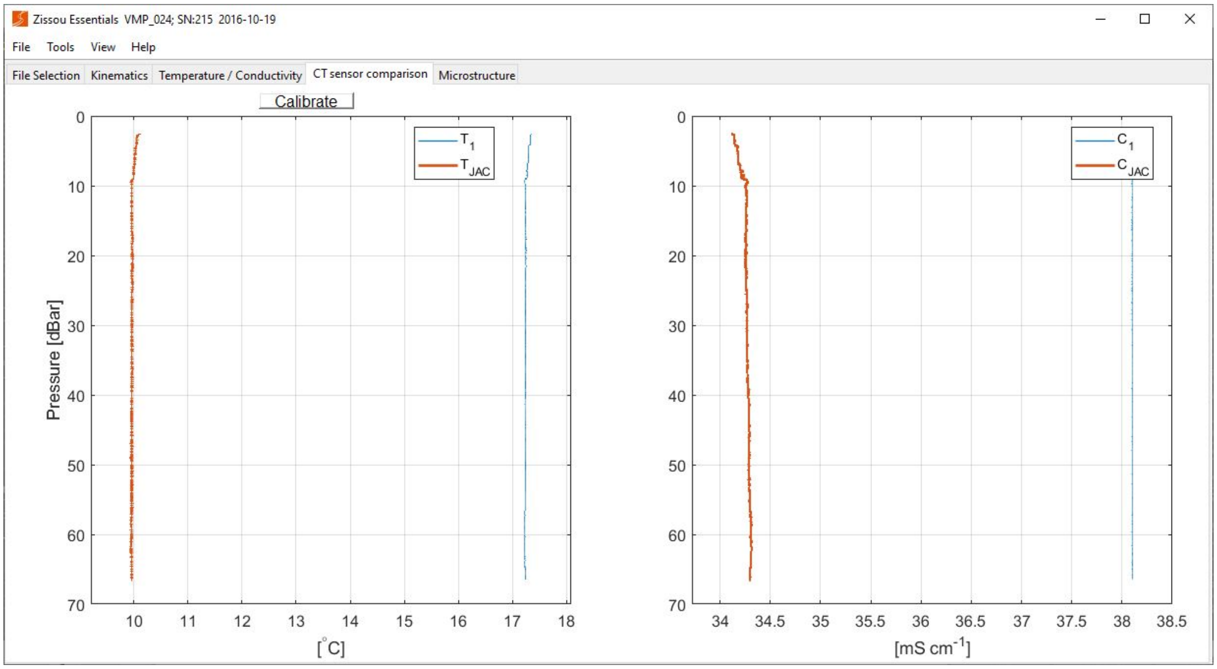

Figure 6: Figures presenting the thermistor and micro-conductivity data compared with CTD data when available. In this case, the offset between data arises because *T*1 is uncalibrated and nominal coefficients have been used to convert the raw *T*1 signal into physical units. Press the "**Calibrate**" button to perform the *in situ* calibration. Refer to section 4.4 for additional information.

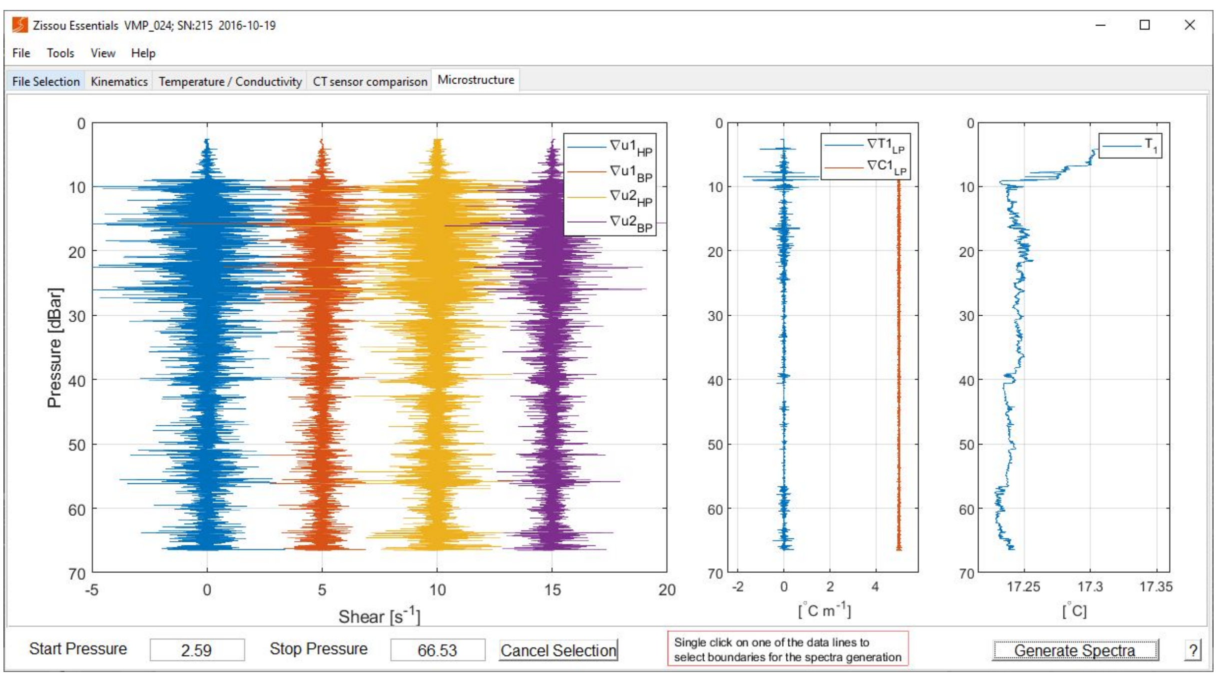

Figure 7: Figures presenting the microstructure data of the shear, temperature gradients and micro-conductivity gradient as well as the background temperature, as measured by the thermistor.

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At this stage, most data channels have been displayed for analysis and interpretation. To extract the spectral curves from your data, you must select a subset of the data from the microstructure figure. The range can be selected by clicking the location of the boundaries on the graph, or by entering numerically the desired bounds. For this tutorial, we have selected the region from 30 to 40 dbar. Press "Generate Spectra" once satisfied, to display the spectral plots (Figure 8).

This tab presents two logarithmic plots of the spectra. The left panel presents the curve as function of the wavenumber in cycle per meter [cpm] and the right panel as function of frequency in Hertz [Hz]. A detailed description of the spectral plots including their content and an interpretation guideline is provided in the Data Processing Manual.

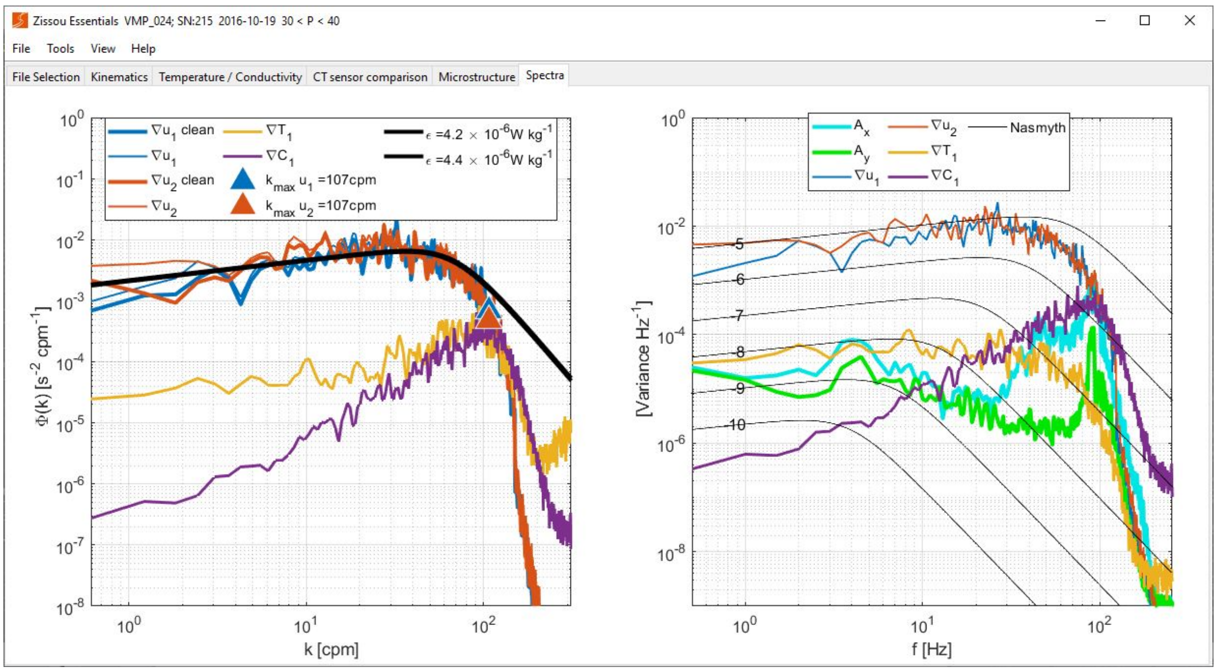

Figure 8: Figures presenting the spectra for the selected range in wavenumber (left) and frequency (right) domain. The spectra of shear, temperature gradient and micro-conductivity gradient are shown in both panels, whereas the vibration sensor data are only displayed in the frequency domain. The dissipation rate is calculated for each shear probe and the associated Nasmyth curve is overlaid in the left figure. The Nasmyth curves in the right panel (black) are plotted for nominal ϵ values in factor of 10 increments.

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2.2 MicroRider

The second part of the tutorial presents a walk-through of typical data inspection and visualization within the Zissou Essentials software for glider mounted instrument. The data used for this tutorial was collected near the Faroe Islands using a MicroRider1000. *We wish to thank Dr. Ilker Fer for allowing us to use his data*

To get started with the data processing, first open your software, ensure that the radio button "**Analyse Profile**" is selected and press the "**Select File**" button. Using the dialogue window, navigate to the location of the downloaded **Sample_Data** folder and open the *DAT_059.p* file. This will open the configuration string GUI (Figure 9).

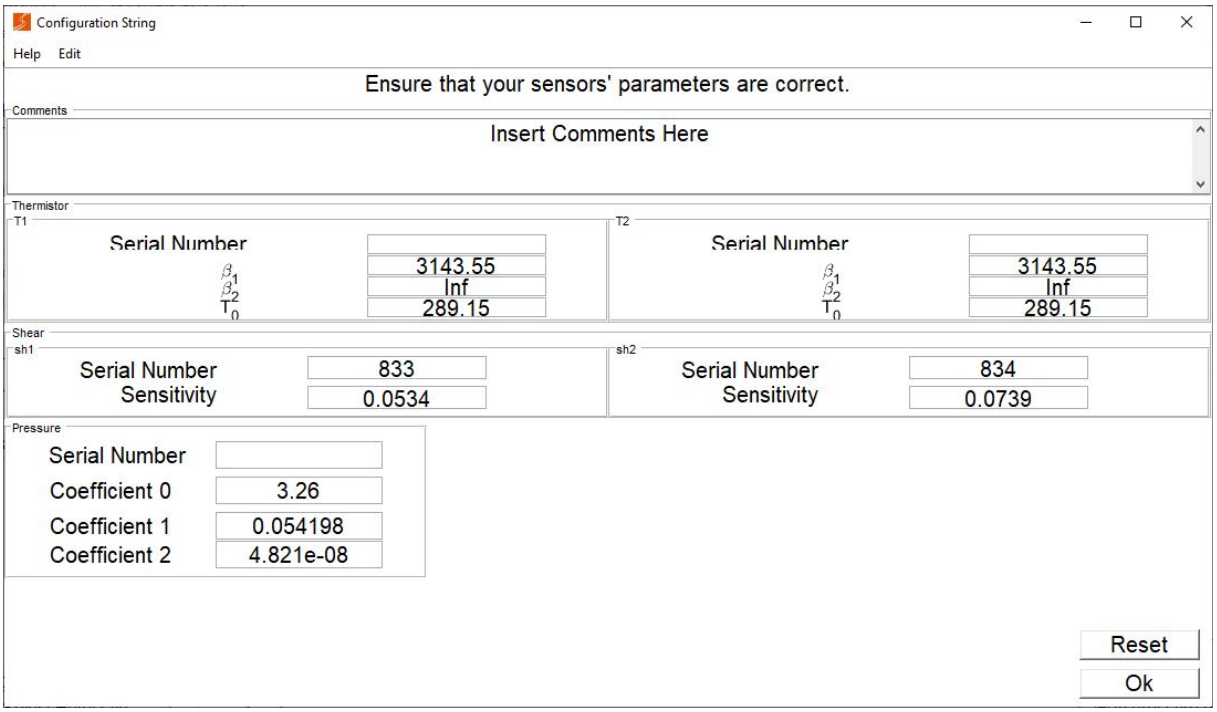

Figure 9: User interface presenting the partial content of the MR's configuration file

When opening a file in Zissou, the software opens the configuration file editing tool. This tool highlights a subset of parameters used for the conversion of your data to physical units. This is meant as a reminder to update your calibration values when changing or re-calibrating a sensor on your instrument. **Press OK to proceed**. This will launch the conversion to physical units.

The time series of the pressure sensor data should now appear in the main window (Figure 10).

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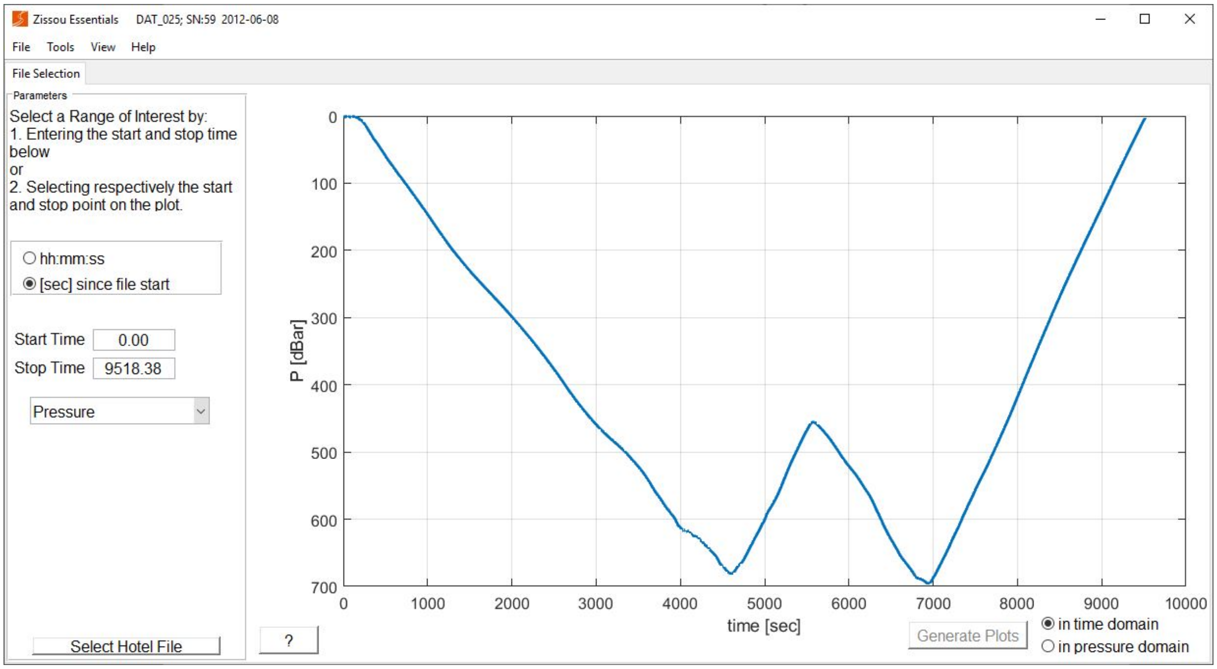

Figure 10: Initial display of sensor data to selection a Range of Interest in your file

The scope of this tab is to let you select a range of interest within your data file. Zissou Essentials requires you to **choose one profile to move forward with processing.** This can be done in one of two ways:

- Manually change the start and stop time in the parameters panel on the left side of the window. This will highlight the selected region in red; or
- Select the time boundaries on the graph by clicking, respectively, on the start and stop of your range of interest.

For this tutorial, the first profile is selected (see Figure 11). The software will highlight your selection in red.

Note that you are not limited to choosing your Range of Interest from the pressure sensor data. Use the drop-down menu in the left panel to select an alternative sensor to be plotted. Section 3.1 presents a description of the different elements of this display.

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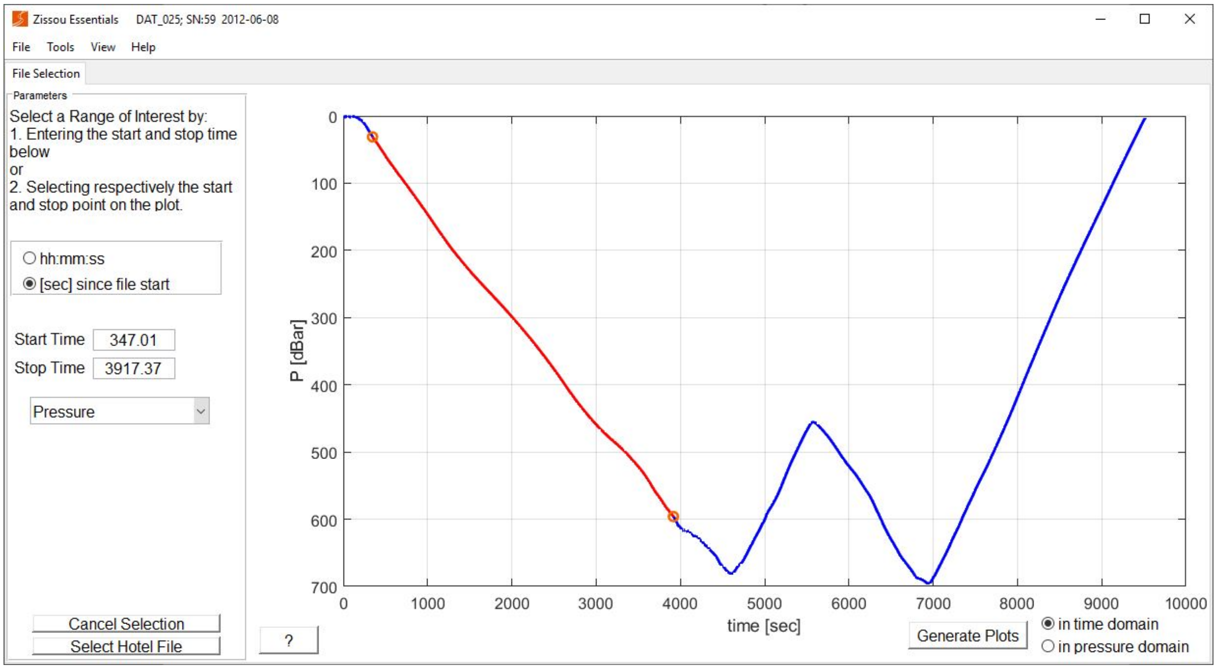

Figure 11: Display of the selected boundary for processing

By default, the software will generate plots in the time-domain for non-vertical profiler. For this tutorial, we select the pressure-domain radio button, before pressing the "**Generate Plots**" button. This generates a series of tabs displaying your data (Figures 12 – 14).

For a detailed description and interpretation of the content of those panels, refer to your Data Processing Manual.

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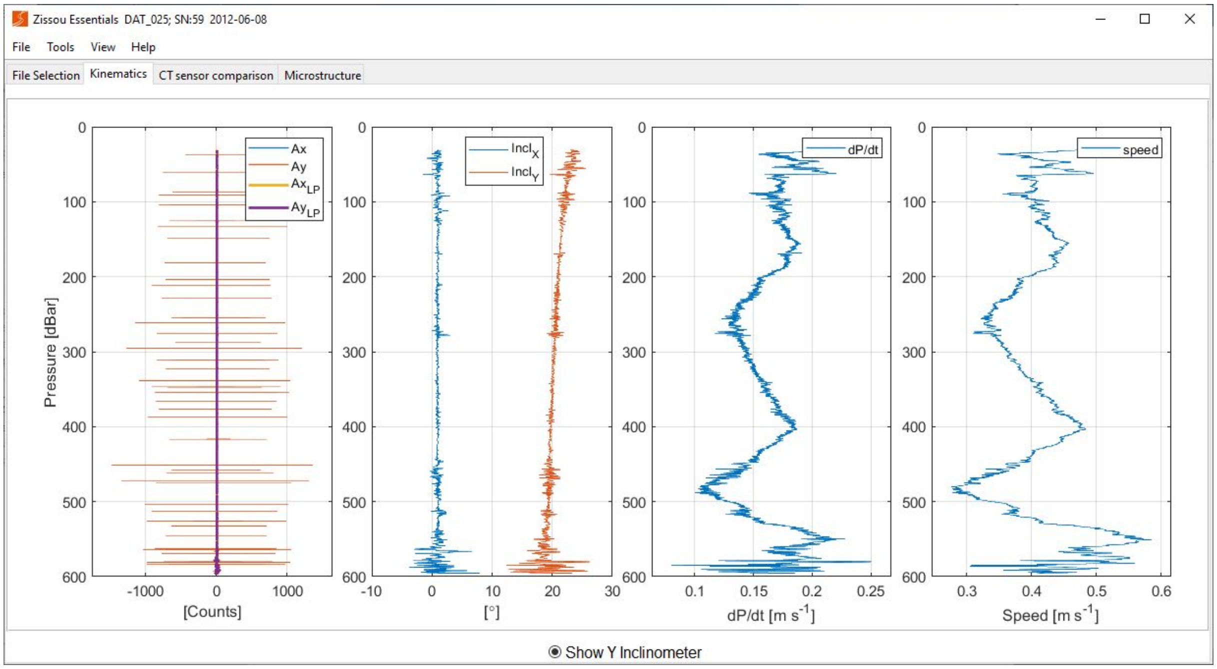

Figure 12: Figures presenting the kinematic data of the selected profile. The large spikes in A_x and A_y are induced by the fin actuator and possibly by battery movement in the glider.

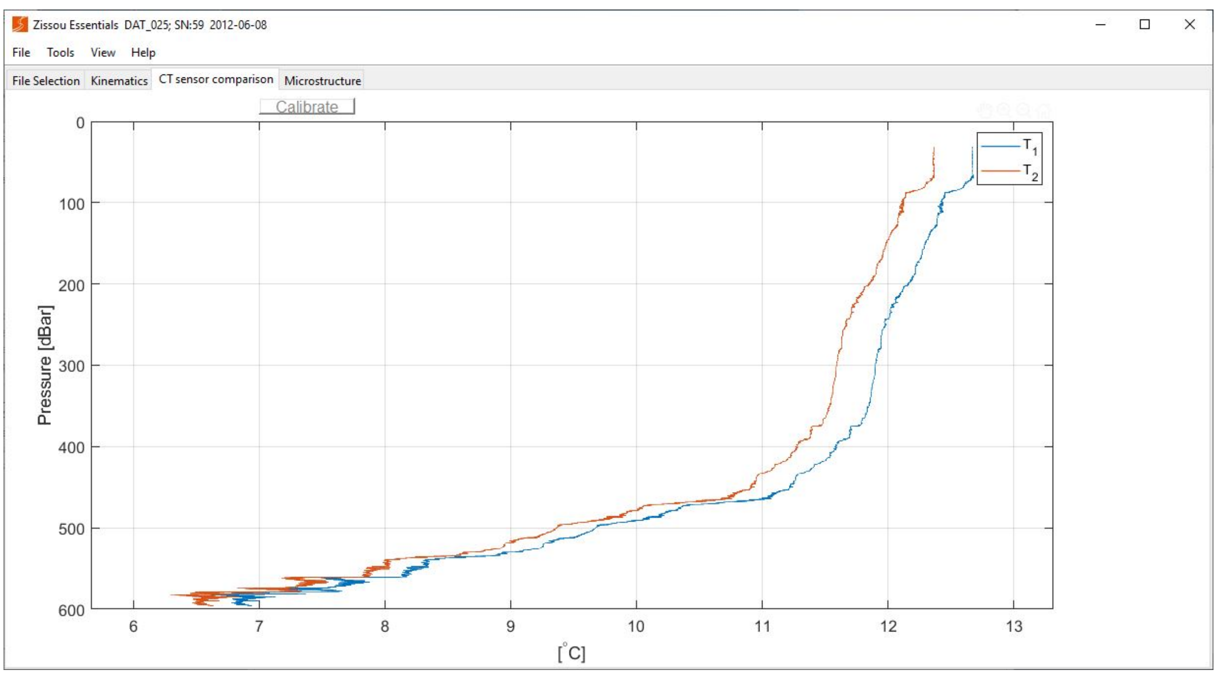

Figure 13: Figure presenting the temperature data reported by the thermistors. The offset between the two thermistors occurs because the sensors have not been calibrated and the conversion to physical units has been done using nominal values.

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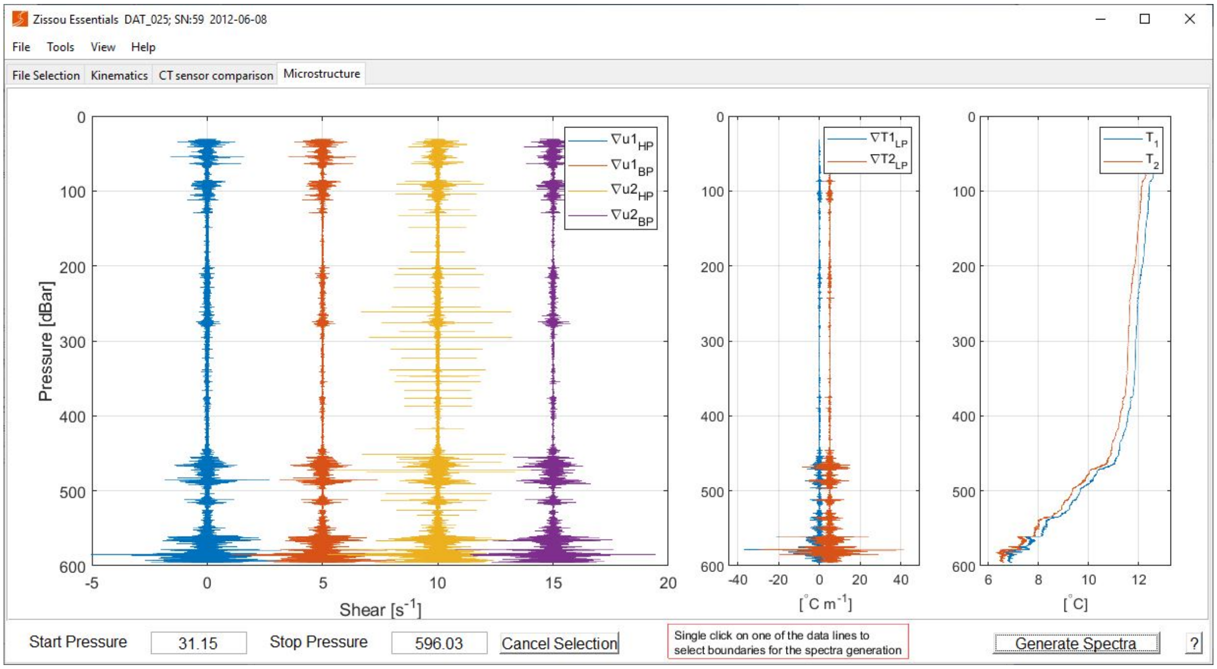

Figure 14: Figures presenting the different microstructure data of the shear and temperature gradient

At this stage, most data channels have been displayed for analysis and interpretation. To extract the spectral curves from your data, you must select a subset of the data from the microstructure figure. The range can be selected by clicking the location of the boundaries on the graph, or by entering numerically the desired bounds. For this tutorial, we have selected the region from 435 to 500 dbar. Press "Generate Spectra" once satisfied, to display the spectral plots (Figure 15).

This tab presents two logarithmic plots of the spectra. The left panel presents the curve as function of the wavenumber in cycle per meter [cpm] and the right panel as function of frequency in Hertz [Hz]. A detailed description of the plots, their components and interpretation is provided in your Data Processing Manual.

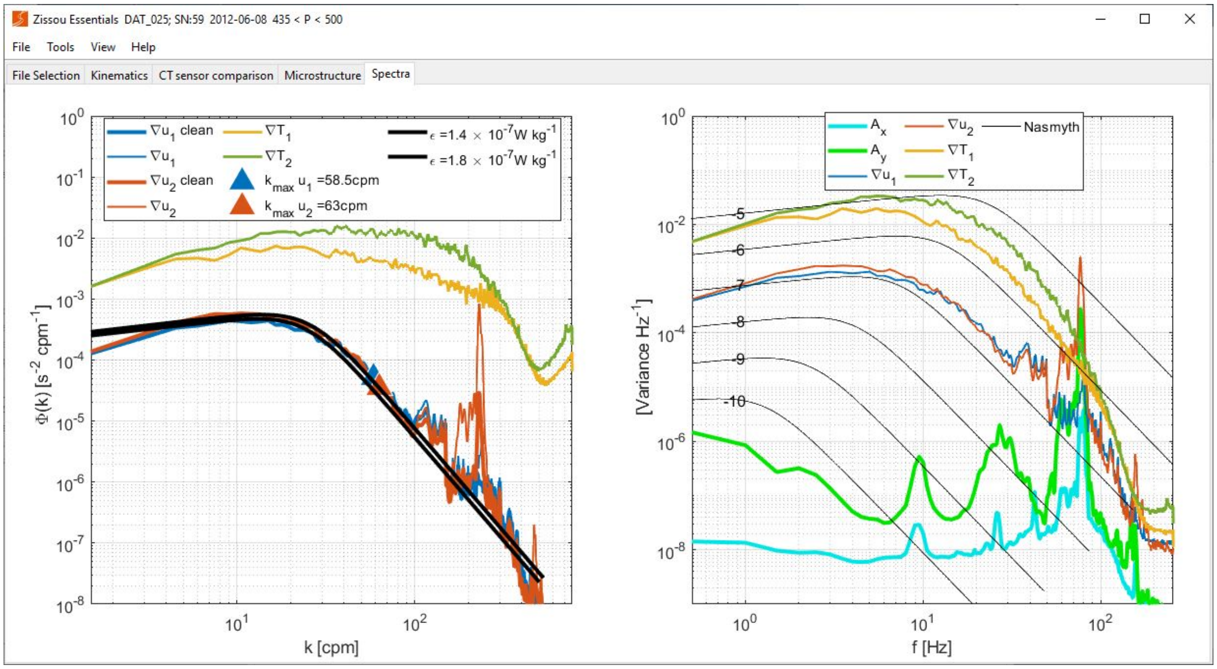

Figure 15: Figures presenting the spectra for the selected range in wavenumber (left) and frequency (right) domain. The spectra of shear, temperature gradient and micro-conductivity gradient are shown in both panels, whereas the vibration sensor data are only displayed in the frequency domain. The dissipation rate is calculated for each shear probe and the associated Nasmyth curve is overlaid in the left figure. The Nasmyth curves in the right panel (black) are plotted for nominal ϵ values in factor of 10 increments.

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3 Software Components

The scope of this section is to provide additional information on the various software components presented in the tutorial above. Note that an in-depth description of the graphics or the background processing that generates the graphs (*e.g.* conversion to physical units, estimation of the dissipation rate, etc.) is beyond the scope of this document but detailed in the Data Processing Manual.

3.1 Selection of the Range of Interest

The software, after your data has been converted to physical units, provides a time-domain visualization of all the sensors on your instrument. Pressure is shown by default, but the data from a different sensor can be displayed by selecting its name from the drop-down menu (Figure 16, item 1). The time-domain plots are provided to assist you with the selection of a range of interest. To visualize your data further, you must select the segment of your data that you wish to inspect. Figure 16 shows an example where the first profile has been selected.

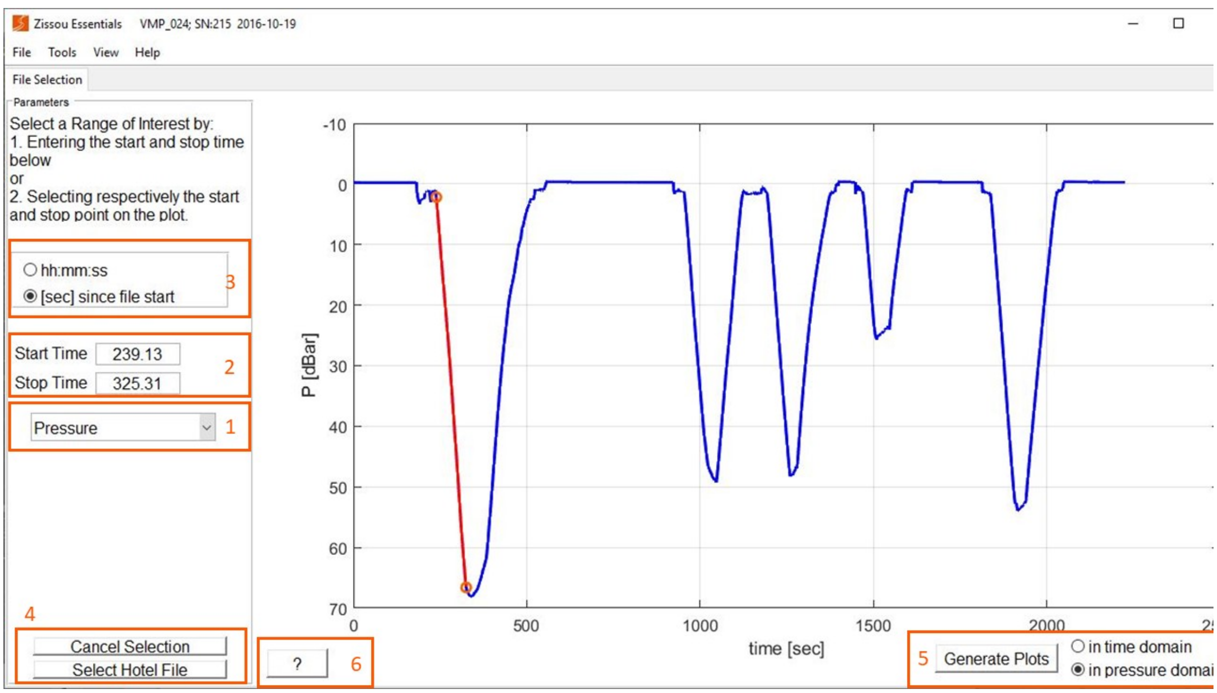

Figure 16: Plot of the pressure data of a VMP instrument as a function of time for profile selection

As can be seen in the figure, the datafile has multiple profiles but, **they must be processed separately**. The figure shows the selected profile highlighted as it was selected on the graphic by clicking, respectively, on the beginning and the end of the profile.

NOTE: If one of the graph tools (the Zoom In tool for example) is selected, you will **not** be able to select your range of interest. Click on the tool icon again to unselect it.

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The drop-down menu (Figure 16, item 1) enables you to change the plot to a different sensor. This may be useful to confirm your selection.

As an alternative to selecting the range on the graph, you can also manually enter the start and stop time of your range of interest (Figure 16, item 2). You can additionally select the time convention for your choice *i.e.* in seconds since the start of the file or in hours:Minutes:Seconds using the radio button (Figure 16, item 3).

If you are displeased with your selection, you can re-select the bounds of the selection on the graph directly or you can press the “**cancel selection**” (Figure 16, item 4) and select again.

Finally, once satisfied with your selection, the “**Generate Plots**” button will create a series of tabs providing graphs of the data from your sensors.

Note that the data can be visualized as either:

1. a function of time, with the time plotted on the horizontal axis and the sensor data on the vertical axis; or
2. a function of depth, with the pressure plotted on the vertical axis and the sensor data on the horizontal axis.

You can toggle this option with the radio button (Figure 16, item 5).

3.2 In-situ Thermistor Calibration

The thermistor and micro-conductivity sensors are designed to acquire small-scale fluctuations of the temperature and conductivity, respectively. The sensor accuracy typically drifts significantly with time, causing an offset with respect to the actual temperature or conductivity value. Therefore, the software offers a comparison between the microstructure and CT sensors (which have higher accuracy but low sampling rates) when they are available (Figure 17). This will also provide you access to the *in situ* calibration tool. The calibration tool is detailed in Section 4.4. The scope of the calibration tool is to update your thermistor calibration parameters to yield accurate temperature measurements that agree with the CT data.

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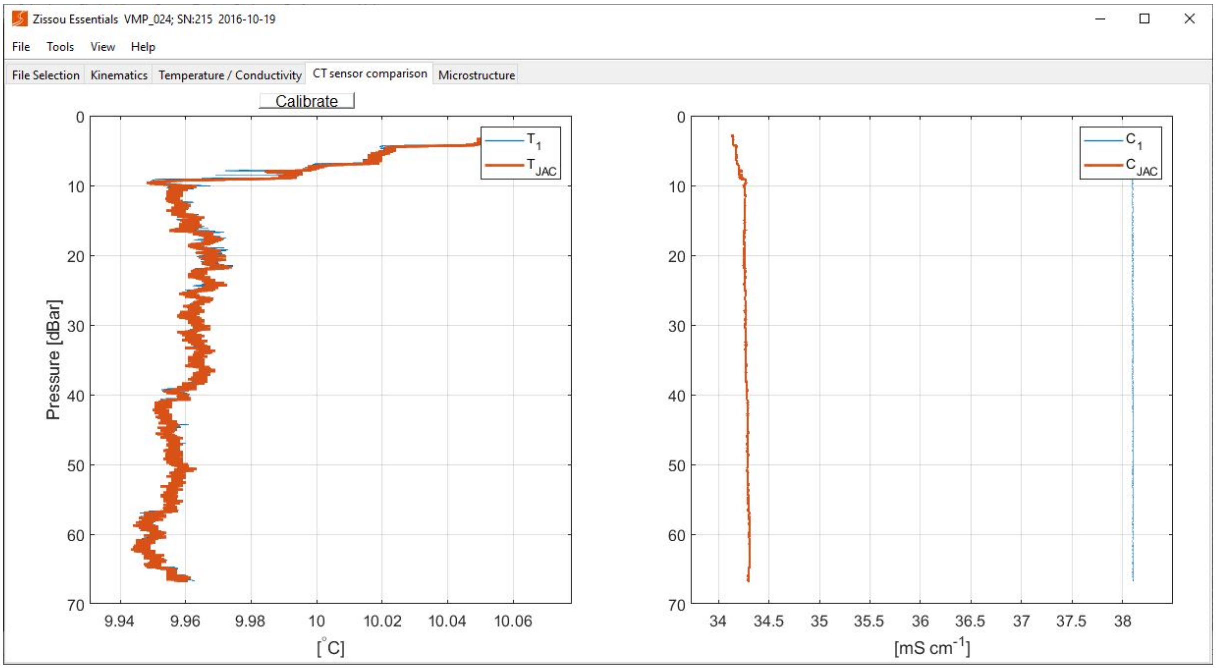

Figure 17: Comparison between the slow (T_{JAC}) and fast (T_1) measurements of temperature (left) and conductivity (right)

3.3 Selection of Spectral Range

In the microstructure tab, you must select a range of data in order to produce the spectral tab. The selection of the range can be done as in the range selection window (Section 3.1). You can either:

- Click on two points in one of the plots to set the start and end of your segment; or
- Manually enter the boundaries of your selection in the figure's domain (pressure or time).

To visually assist with your selection, the software places markers on the graph identifying your selected boundaries. You can modify your selection by clicking elsewhere on the graph or by pressing the "**cancel selection**" button and starting again. Additionally, you can verify and update the processing parameters used to generate the spectra using *Tools* → *Processing parameters* (See Section 4.3 for details). Once you are satisfied with your selection and processing parameters, press "**Generate Spectra**".

4 Software Tools

The Zissou Essentials software has numerous tools which are accessible through the "Tools" bar menu item of the same name. The available tools include:

- **Configuration file editing:** review and update the parameters of your file for conversion to physical units
- **Vehicle Selection:** select your vehicle type and profile speed algorithm
- **Parameter Selection:** review and update your file's processing parameters
- **Thermistor Calibration:** calibrate your thermistor using *in situ* CT temperature data
- **Analyse Bench Test:** visualize your instrument's electronic noise for quality control

4.1 Editing a Configuration File

The data files (`p`-file) collected with Rockland instruments has the configuration file information (that was used during data acquisition) embedded within. This configuration information provides parameters for both the acquisition and post-processing of your data (specifically, conversion to physical units). The file structure and content are extensively described in your Data Processing Manual.

The configuration file is a human readable ASCII file that can be modified within a "good" text editor. However, the configuration file editing tool provides you with a user-friendly user interface to modify a subset of conversion parameters which are likely to require updating. Therefore, when opening a new file, it is recommended that you review the parameters, edit if necessary, and then proceed. If you do not have the calibration coefficients on hand, you can continue with nominal values and edit the parameters at a later time.

Figure 18 presents an example of the configuration file editing tool loaded with the configuration string from the VMP-250 data file used in the first tutorial (Section 2.1).

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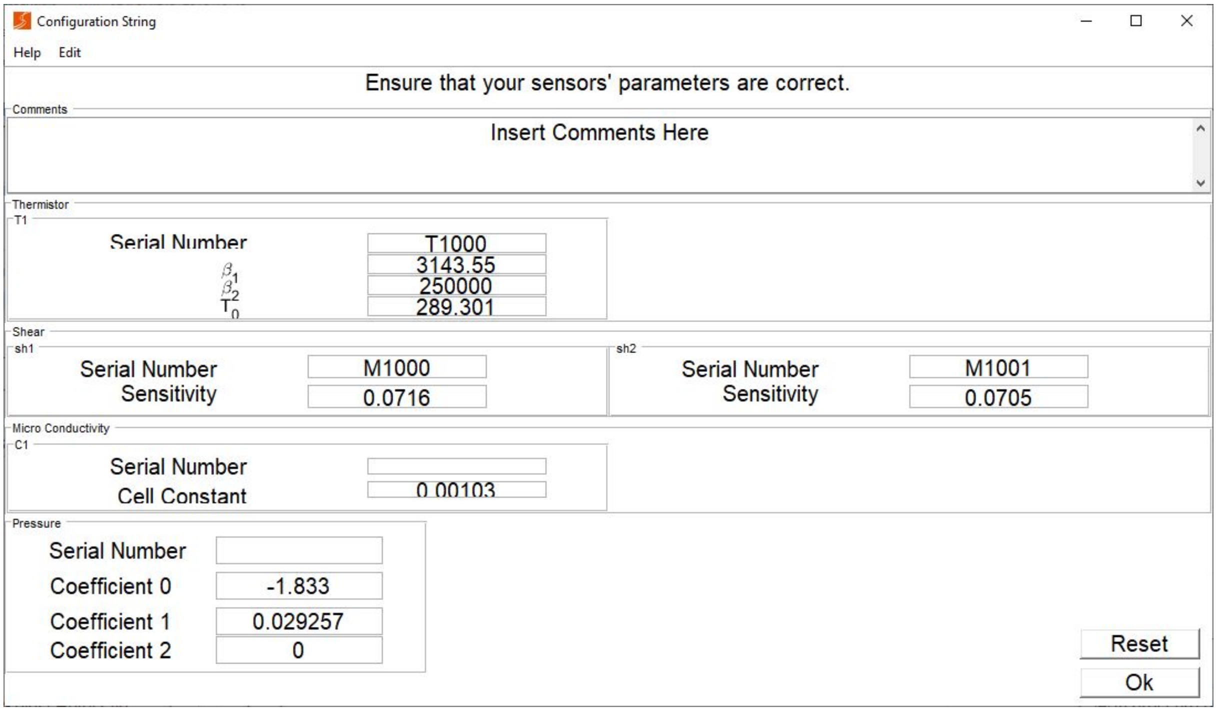

Figure 18: Configuration file editing tool opened when loading VMP-250 data file. This instrument includes a thermistor, two shear probes, a micro-conductivity sensor and a pressure transducer.

For details on the different sensors, the role of their conversion parameters and additional information, please refer to the Data Processing Manual. The processing manual additionally provides a list of almost all channel types and the process required to convert the raw data to physical units.

The editing tool allows you to easily update the parameters that will change as result of a new calibration or a change of probes. To update a value, select the field you want to edit and type in the new information. The modification will be highlighted with a blue box.

We also encourage you to add your initials and comment in the "**Insert Comments Here**" box to keep track of your modifications (*e.g.* SZ: Update the sensitivity of Shear probe M1000 after calibration). Note that the software will add a date and time stamp to your comment and patch this comment to the beginning of the configuration string that is embedded in your data file.

If you are satisfied with the current parameters displayed in the window, you can press "**Ok**" or simply close the window to proceed. If you wish to reset to the parameters first displayed in the window, press "**Reset**" to reset all modified values.

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Edit Manually

The configuration file management tool also enables you to manually edit the configuration information that is embedded in your data file. In the bar menu, select **Edit** → **Edit Manually**, the configuration file will be opened in a text editor to allow you to update the ASCII file. Once you have modified the file, ensure that the modifications were saved. Select **Edit** → **Patch File** which will replace the current configuration file with your edited file. We recommend using this option **only if you are familiar with the configuration file structure**. The structure is explained in detail in your Data Processing Manual.

Finally, the option **Edit** → **Revert** gives you the option to revert your configuration file to the one provided by Rockland when you first received your instrument.

4.2 Vehicle Selection

As a **best practice**, we recommend writing your vehicle type in the `instrument_info` section of your configuration file (see Figure 19) as the `vehicle` field. A list of recognized vehicle types is provided in the Data Processing Manual (which also includes the vehicle's default algorithm for speed calculation).

```
; --------------------
;This section identifies your instrument. Only the vehicle is important.
[instrument_info]
vehicle = vmp      ; downward profiling. Use either vmp or rvmp but not both.
;vehicle= rvmp     ; upward profiling
model   = vmp-250IR  ; The actual model. Used for trouble shooting.
sn      = 215      ; The serial numnber of the instrument. For trouble shooting

; --------------------
; The next section is optional and can be expanded. Do not use the parameter "id = ".
[cruise_info]
operator    = Victor 2016
project     =
ship        =
leg         =
```

Figure 19: instrument_info section of the configuration file.

In the event where the vehicle is not specified or if additional information is required to compute your instrument's speed, the software will prompt you via the user interface (Figure 20). Based on your vehicle type you may be required to enter a numerical value for a constant profiling speed or provide the software with a hotel file providing the vehicle's speed of profiling. The Data Processing Manual provides extensive information about the software's speed of profiling calculation and a description of the hotel files.

If you select the "**Constant**" speed algorithm, you will need to enter a valid numerical value for the constant speed (in [m/s]). If the selected speed algorithm is "**hotel**", you

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will need to select a hotel file[1] on your computer.

Finally, the vehicle selection tool can be accessed at a later time through *Tools* → *Vehicle selection*. Modifying the vehicle's selected speed algorithm will proceed to reconvert your data to physical units using the new speed.

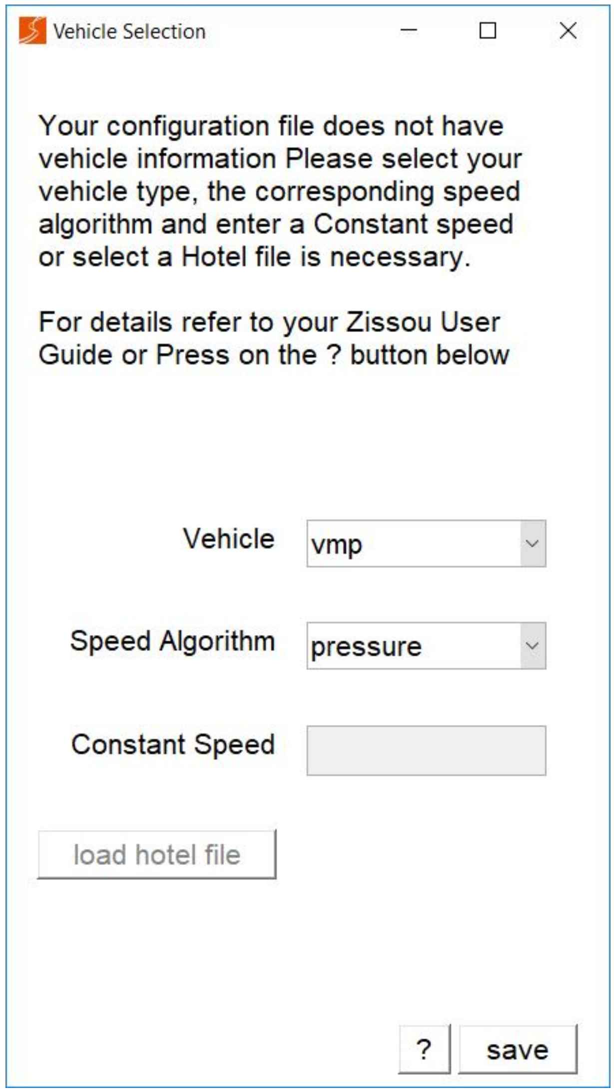

Figure 20: Vehicle selection tool

[1]Description of th hotel file is provided in your Data Processing Manual

4.3 Parameter Selection

The parameter selection tool allows you to modify the different parameters being used within the software both for data visualization and processing. As can be seen in Figure 21, the software lets you update the following parameters:

- **fft length:** The spectra presented in the software are calculated from your data within the boundaries selected in the microstructure tab (Section 3.3). The specified region is subdivided into segments of fft length in duration that overlap by 50%. The fft length also sets the resolution of the spectra (*i.e.* Δf = 1/fft_length)
- **(High & low) Pass Cut-off:** The cut-off frequency of the high-pass and low-pass filters applied to the data. **Note:** The high pass filter is used to remove any low frequency signals from the microstructure data. The filter influences the spectra and the dissipation rates that are computed. On the other hand, the low pass filter is only used for improved visualization of the microstructure data
- **Anti-Aliasing frequency:** This value represents your instrument's anti-aliasing frequency. Note that this is based on the instrument's electronics and should only be changed if your instrument has a different anti-aliasing frequency. (This typically applies to instruments designed to operate in strong flows, such as a VMP-250-IR-TE).
- **fit order:** The order of the polynomial fit applied to the logarithm of your spectra to provide one of the upper bound of integration for estimation of the dissipation rate. For more information, refer to Rockland Technical Note 028.
- **Grad (C & T) method:** The software offers two methods for calculating the gradients of the temperature and micro-conductivity data. The high pass method obtains the derivative by high passing the pre-emphasis signal[2] whereas the first difference consists of the "classic" discreet derivative method. Zissou defaults to the high pass method.

[2]For additional details refer to Technical Note XX

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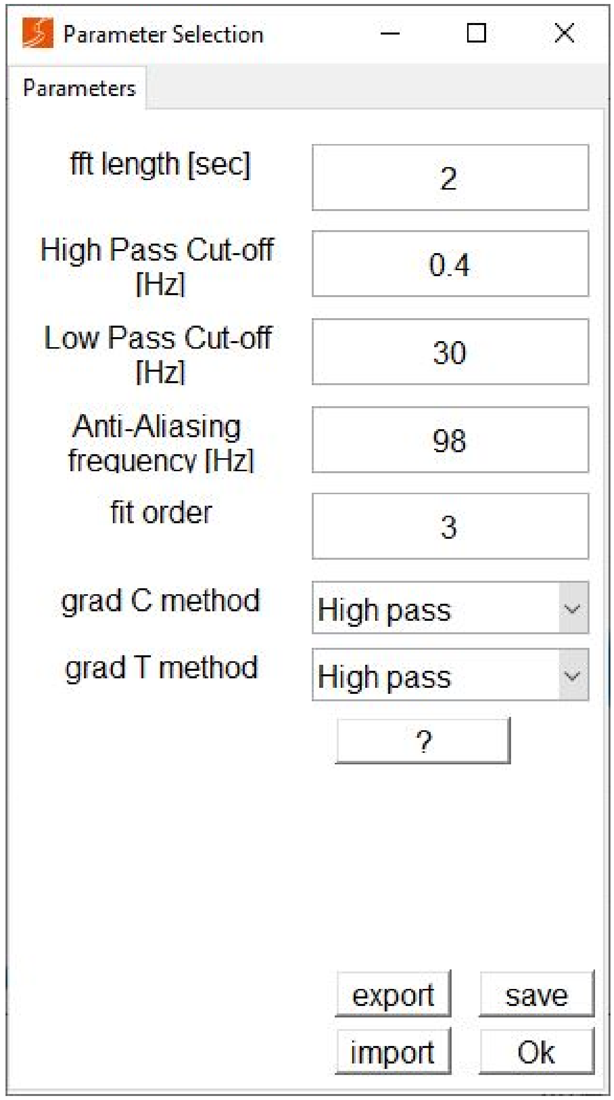

Figure 21: Parameter selection tool

When you are satisfied with your modifications, press "**save**" to implement your modifications and re-process your data. Note that the software also allows you to "**export**" your processing parameters in a **.mat* file to access them at a later time. The "**import**" function allows you to apply parameters that you've exported previously.

4.4 Thermistor Calibration

The FP07 thermistor is converted to physical units using calibration parameters to convert the measured resistance to a temperature value. Although nominal values for those parameters are provided, the sensor can be calibrated before or after its deployment to ensure the best possible accuracy. Figure 6 presents an example where there is a clear offset between the thermistor and CT-reported temperature, which indicates that the thermistor needs to be calibrated.

The thermistor calibration tool consists of a module to perform the post-deployment calibration of the sensor using *in situ* data. This can be done when your instrument measures a reference temperature, through either a SeaBird-CT or JAC-CT. The calibration tool can be opened via either the bar menu *tools* $\rightarrow$ *Calibrate FP07* or the tab comparing the microstructure and the CT data (see Section 3.2).

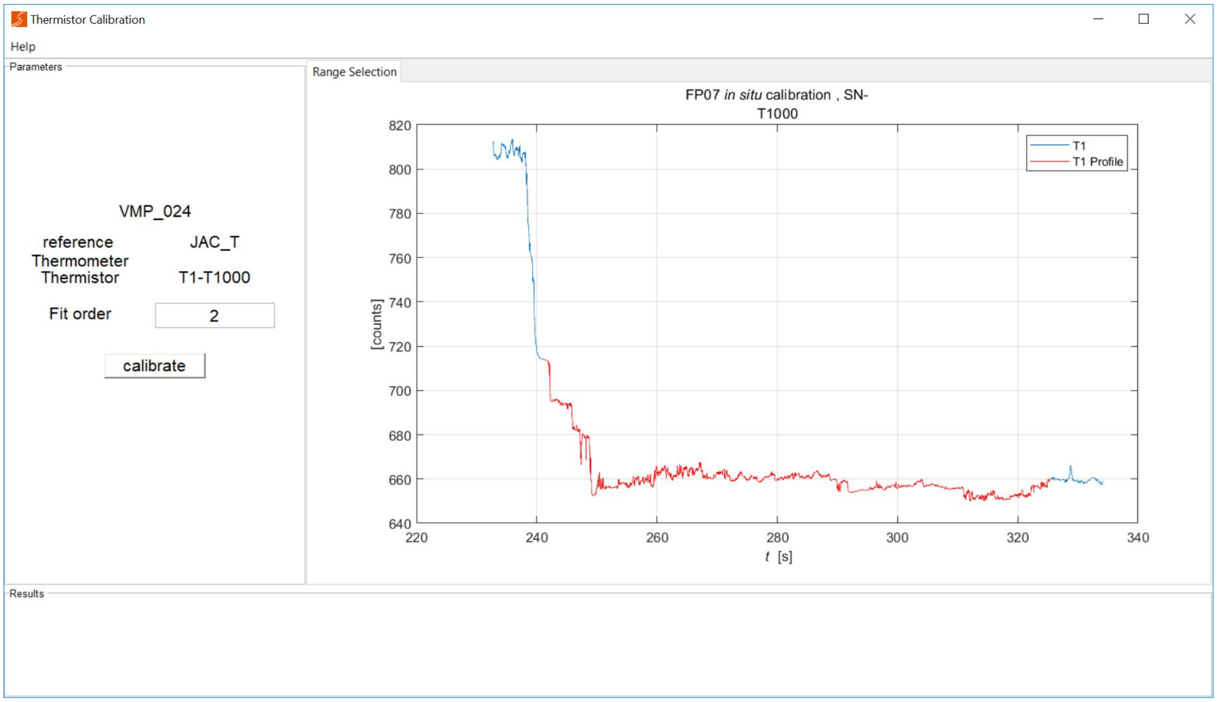

Figure 22: Initial window of the calibration tool. The software displays the reference thermometer and the thermistor to be calibrated. If your instrument has more than one thermistor, the tool lets you choose which thermistor to calibrate.

The calibration tool allows you to select the thermistor you wish to calibrate as well as the reference thermometer (if multiple are available). The software will additionally let you select the order of the fit used for the calibration. The default order will be 2, unless the full range of your measured temperature is less than $8°C$. In this case, a first order-fit is used as the default.

Press the "**Calibrate**" button to launch the calibration. This will generate a series of tabs presenting the results of the calibration. The last panel (see Figure 23) presents both temperature sensors as well as the difference between the sensors. This will enable you to visually assess the quality of the calibration and decide if you wish to update your calibration coefficients. Updating your calibration coefficients is done by pressing the "**save to config**" button, which will save your new parameters to your configuration string, patch it to the data file and proceed with the conversion to physical units with the new coefficients.

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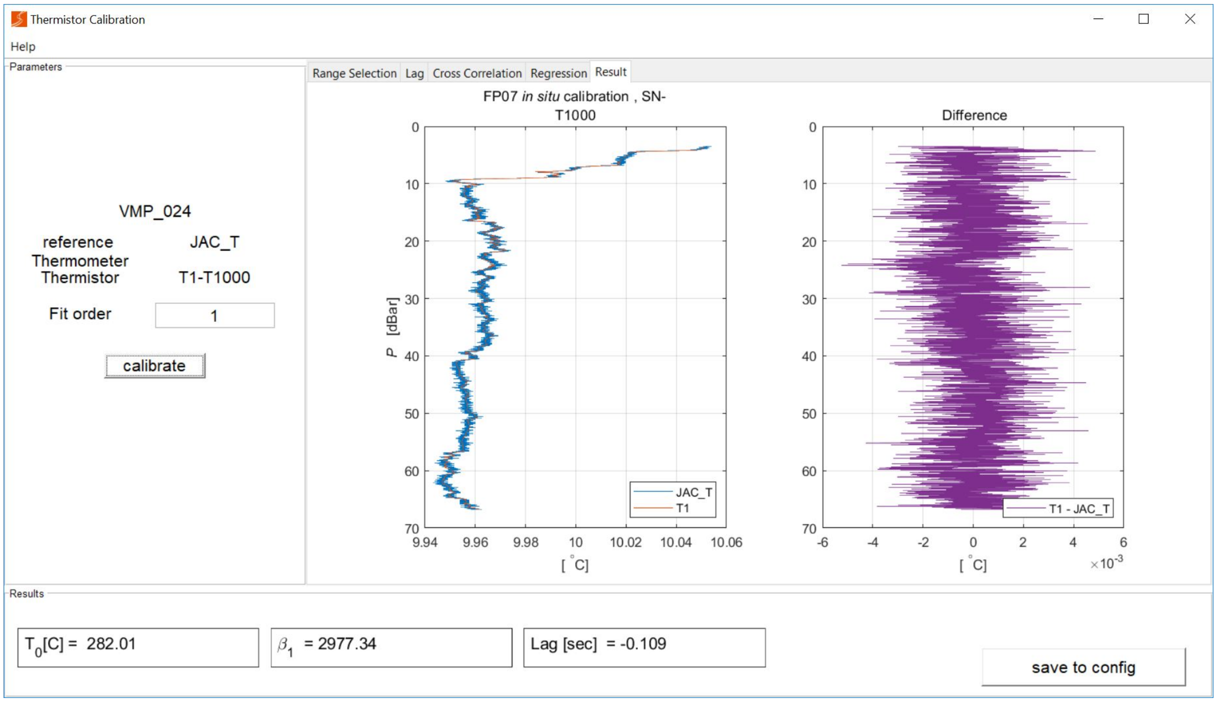

Figure 23: Final panel of the calibration tool. At this stage, the thermistor and reference temperature are plotted together on the left and the difference between the values plotted on the right. Additionally, the results panel at the bottom presents the newly derived parameters.

4.5 Analyse Bench Test

When first opening the software, Zissou offers you two modes of operation to select a file. The "**Analyse Profile**" and its different features are discussed extensively in this document. If, however, you with to assess the electronics of your instrument, you can do so by selecting the "**Analyse Bench Test**" radio button and selecting a file for analysis. This module processes the data file to produce time-series and spectra of some of the channels of your instrument. The resulting graphs will allow you to determine if the electronics are functioning as expected, or if there is unexpected noise present in the signals.

Note: This is designed to test your instrument's electronic components. Therefore, data should be collected while your instrument is on a bench or in the laboratory. Test probes should be installed and the acquisition should last only a few minutes.

Furthermore, because your vibration sensors are analysed during a bench test, it is important to rest your instrument on a cushioned surface, such as on foam blocks, before collecting data. Refer to your Instrument User Manual for more information about the electronics bench test.

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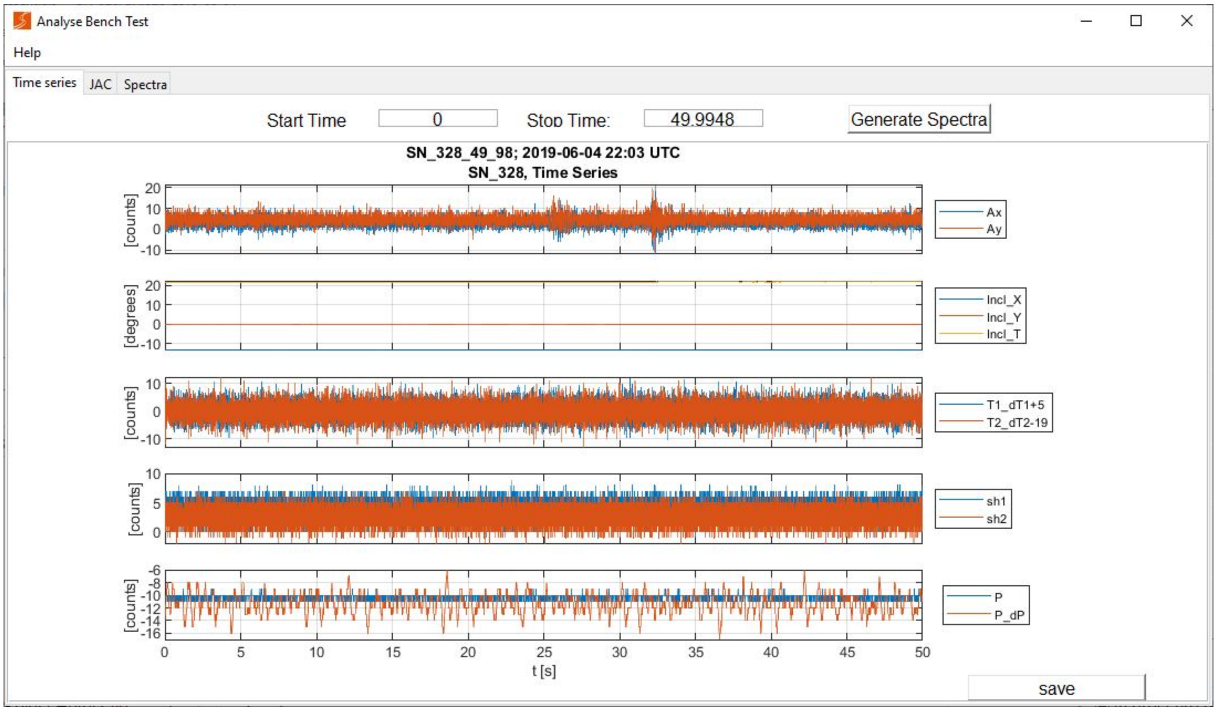

Figure 24: The window displays time-series of different channels on the instruments. The file was recorded when test probes were installed in place of the shear probes and thermistors

Once you've selected a file, the Bench Test Tool becomes visible (Figure 24). Note that the specific graphs will vary depending on the configuration of your instrument. From this display, you can choose to analyse a small portion of your bench test file. This is recommended if the file you have collected is very long or if motion caused the accelerometer (i.e. vibration) signal to be high in a portion of the data. Once you've selected a segment, or if you are satisfied with your data, press "**Generate Spectra**" to calculate the spectra of your signals.

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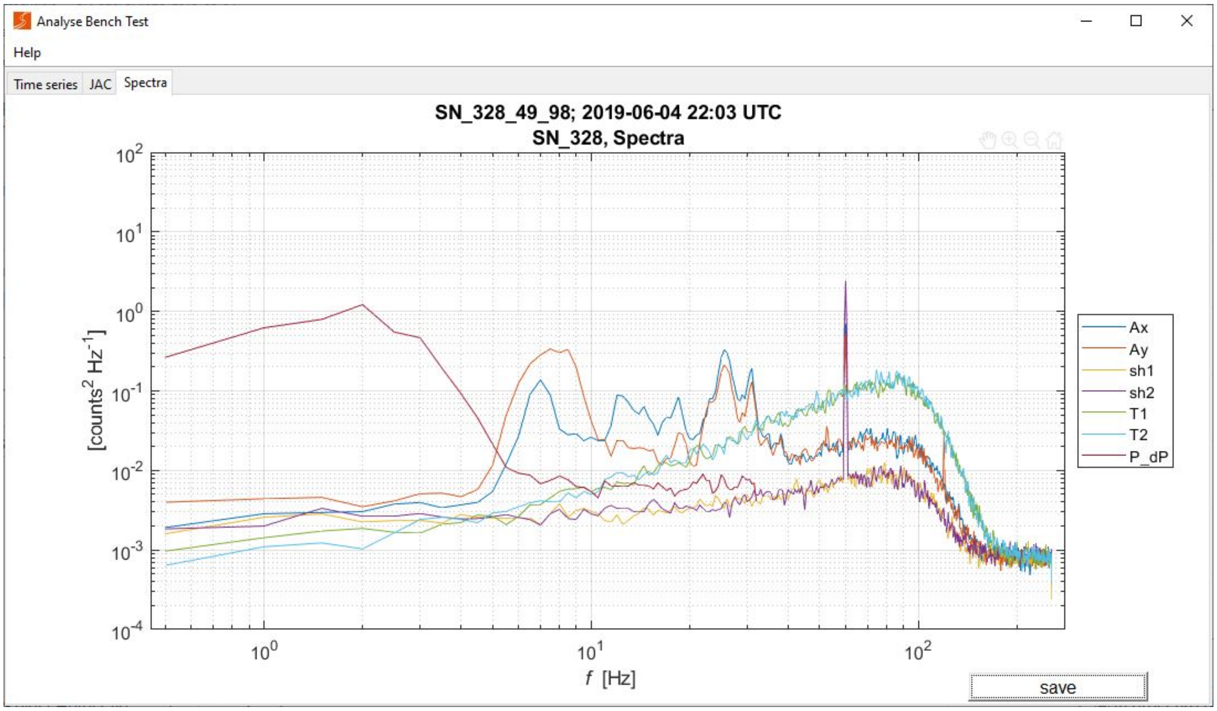

Figure 25: Spectra of the different signals recorded with test probes.

Figure 25 displays the spectra obtained from pressing the "**Generate Spectra**" button. The instrument should be well cushioned to minimize its vibrations. Even so, it is nearly impossible to suppress the output from the extremely sensitive accelerometers. The AC power line frequency (50 / 60 Hz) contamination is also difficult to suppress as can be seen in the narrow spikes in our spectra.

By using test probes in place of the thermistors and shear probes, those spectral curves can be compared directly against those in your instrument's calibration report.

This will provide a qualitative assessment of the noise difference with that observed at Rockland Scientific before your instrument was shipped. Finally, you can save the different figures by pressing "**save**".

5 Support and Feedback

If you have additional question about the software, or if you are experiencing issues, please contact Rockland Scientific at zissou@rocklandscientific.com. If you are encountering an issue with the software, we ask that you include in your email:

- The specific version of your copy of Zissou Essentials. You can find your version number through *Help* → *About Zissou* where your version number is highlighted in Figure 26.
- An attached copy of your Zissou Log file. You can access your Zissou Log-file through *Help* → *Open Zissou Log File* and save the file in a convenient location.

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Feedback In an effort to improve Zissou Essentials, Rockland Scientific would like to get your feedback. To do so, you may answer a list of questions provided on the Rockland Website: Provide your feedback on Zissou Essentials. or by sending an email to zissou@rocklandscientific.com.

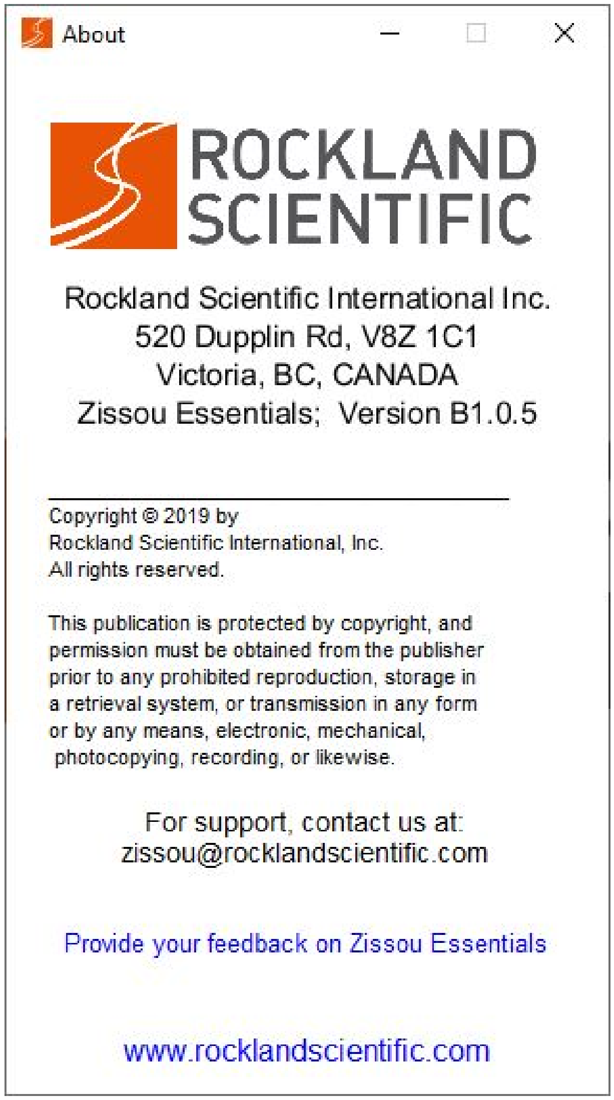

Figure 26: Zissou About page. The two link at the bottom of the window lead respectively to a Zissou Essentials feedback form and the Rockland website.

A Software Installation

Zissou Essentials is a Matlab based software redistributed as a standalone application. This means that our software installs both a version of the Matlab Runtime library and the Rockland Scientific source code of the software. To launch the installation process, double-click on the executable installer (*i.e. the *.exe* file for Windows or the **.app* file for MacOS). Before proceeding with the installation, you may want to confirm that your computer system meets the software requirements outlined in section A.1. More details of the installation process is presented in section A.2

A.1 System Requirements

Zissou Essentials is a standalone software which is self-contained in the installer. Therefore, the software does not require you to have an internet connection.

The software has the following OS and hardware requirements:

- OS: (Windows 7 / Mac OS Sierra) or higher
- 64-bit computer
- Hard Disk: 4 GB (or more)
- RAM : 4 GB (or more)

A.2 Installation process

To install the Zissou Essentials software, launch the installer via the *Zissou_Essentials.exe* (or *setup.app* for Mac). Figures 27 through 31 show the required steps to install the software successfully.

Note: On Mac you may be required to “Ctrl + click” on the installer to grant permission to run the installation process.

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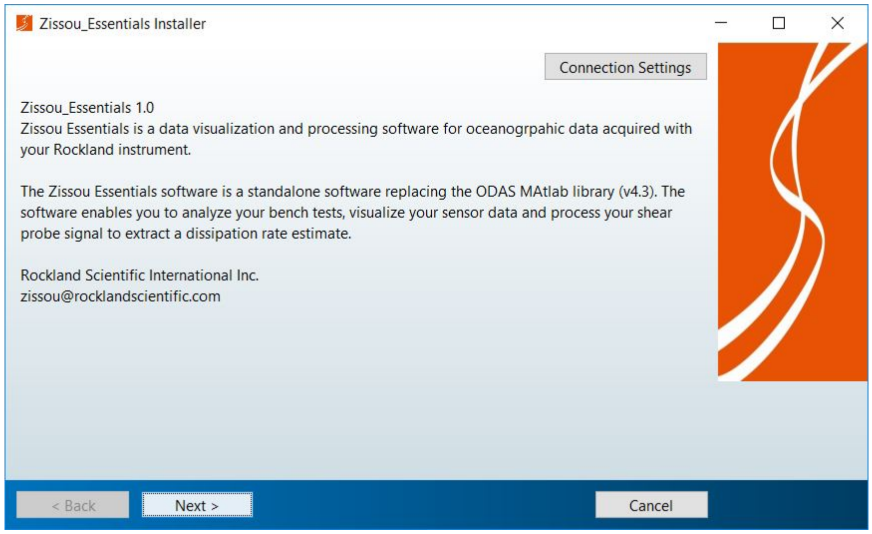

Figure 27: Initial description of the software

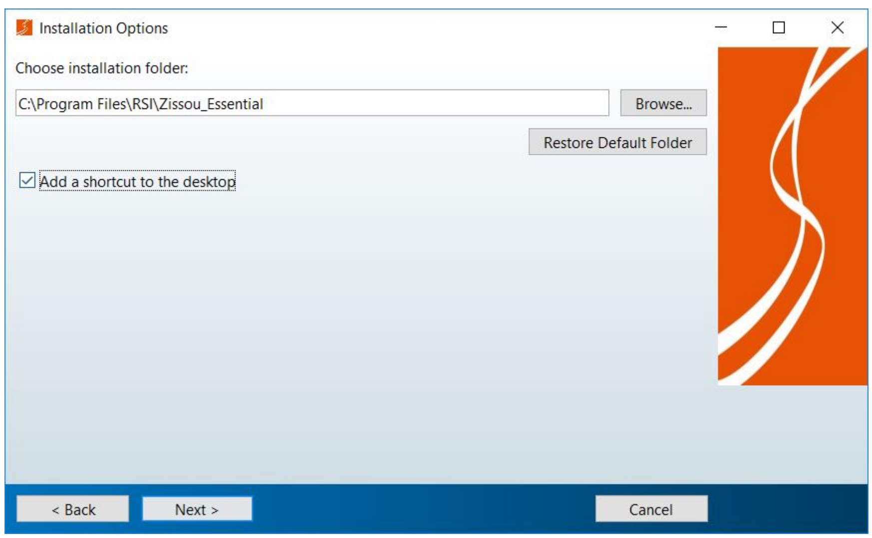

Figure 28: Selection of the Installation folder for the application. To create a **Shortcut**, click the "Add a shortcut to the desktop" option.

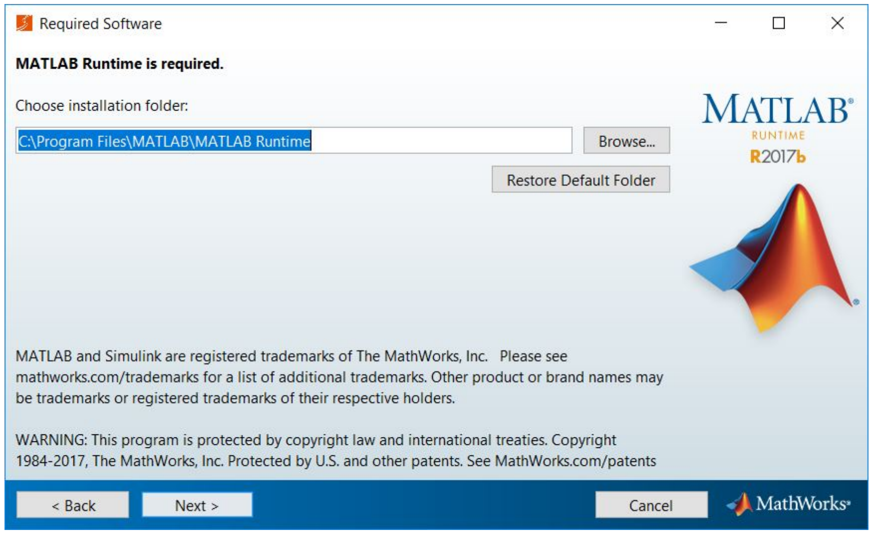

Figure 29: Selection of the installation folder for the Matlab Runtime environment.

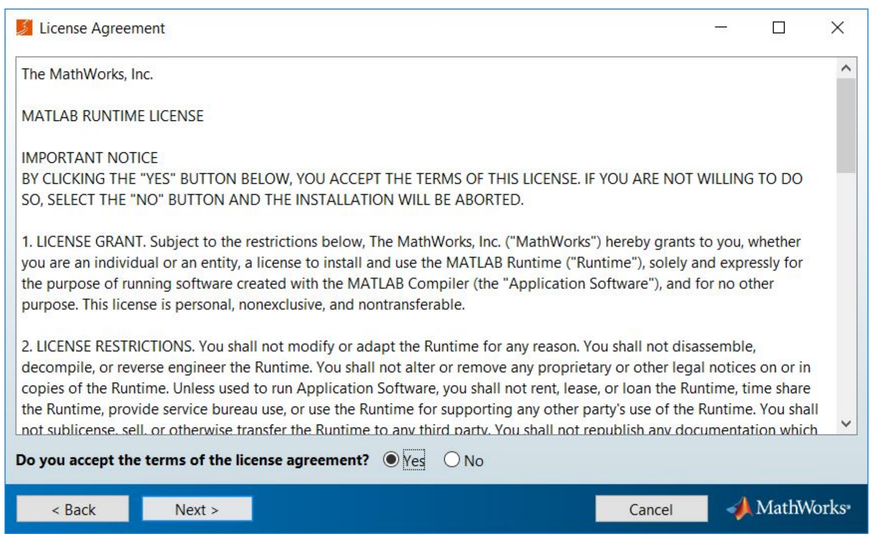

Figure 30: MathWorks License agreement. You must accept the agreement to move forward.

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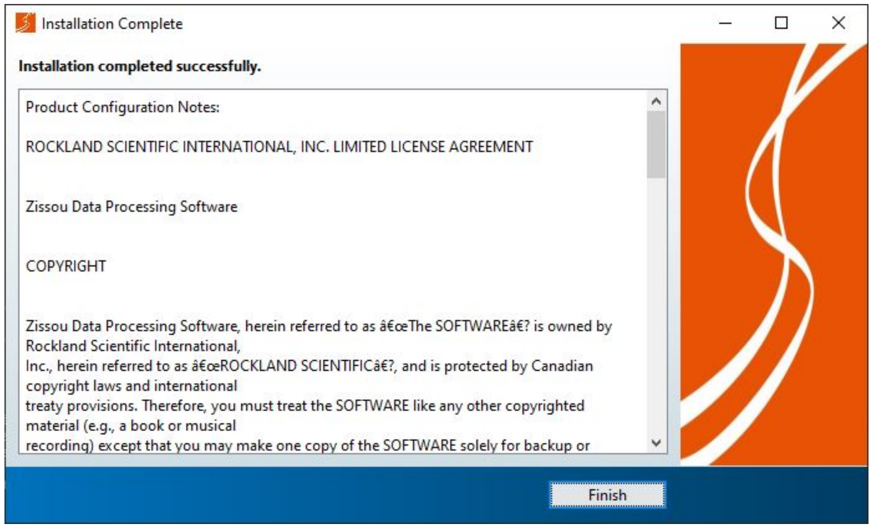

Figure 31: Rockland Scientific End User License Agreement

B Log File & Error messages

The Zissou Essentials software keeps records of the different events which occur within the software. This includes typical processing events as well as warnings and errors provided by the software. This is an important aspect of the software which will greatly simplify any support and troubleshooting.

Your log file can be opened within the software through *Help* → *Open Zissou Log* or you can find the file at the following location:

- In **Windows**: Go to:
  `Users/your_username/AppData/Roaming/RSI/Essentials/zissou_log.txt`
- In **Mac**: Go to your intallation directory under applications.

B.1 Log File Anatomy

Your log file is a human readable ASCII file which can be opened in any text editor available. An example of entries found in the Zissou Log file is provided below.

```
14-Jan-2019 17:03:16 - L21-54.1 - User selected /RSI/07_src/Zissou/VMP_024.p
14-Jan-2019 17:06:59 - D12-52.1 - initiating file tab
14-Jan-2019 17:07:01 - L21-52.3 - Plot of sensor :P_slow
14-Jan-2019 17:07:01 - L21-54.8 - redrawing the graphics
14-Jan-2019 17:07:15 - L21-52.6 - updating boundaries from graph
14-Jan-2019 17:07:15 - L21-52.3 - Plot of sensor :P_slow
14-Jan-2019 17:07:18 - L21-52.6 - updating boundaries from graph
14-Jan-2019 17:07:18 - L21-52.3 - Plot of sensor :P_slow
14-Jan-2019 17:08:12 - L21-52.7 - redraw graph with new parameter selection
14-Jan-2019 17:08:12 - L21-54.8 - redrawing the graphics
14-Jan-2019 17:08:13 - L21-55.1 - Creating tab :Kinematics
```

Each software event reported above is time stamped. The middle column is a trouble shooting code for Rockland Scientific staff to identify the location of the event in the event of troubleshooting. Finally, the software provides a short description of the event.

Note: This log file is different from your instrument log file both in content and anatomy. Refer to the ODAS5-IR User Guide for information about your instrument log file.

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