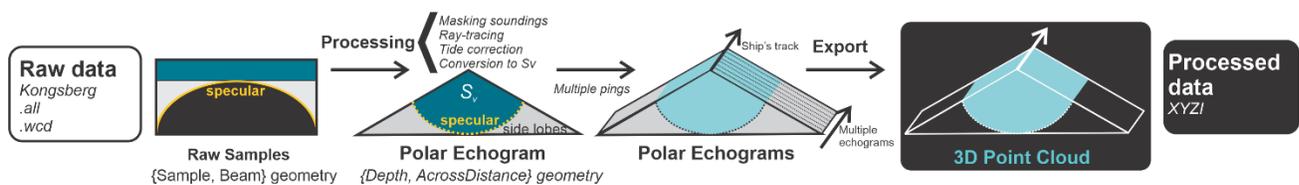


# Timbers protocol for water column backscatter processing in Sonarscope

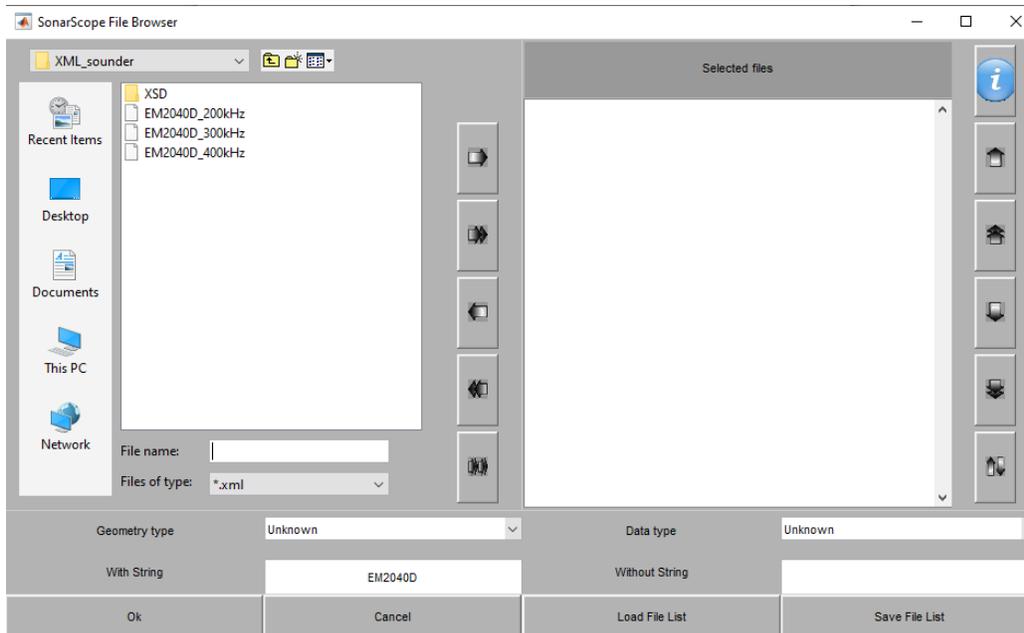
This protocol is based on a one-week intensive Sonarscope course, given by Jean-Marie Augustin (Ifremer, Brest), and advice from Marc Roche and Koen Degrendele (FOD-Economie, Brussels). The protocol describes the processing workflow of the water column acoustic data in Sonarscope. After checking the raw acoustic data, a tide file is computed. Then polar echograms are created. The data is then exported as 3D point clouds. For more detailed information regarding the processing steps, contact Nore Praet or Jean-Marie Augustin.

## Sonarscope processing and exporting steps for TIMBERS



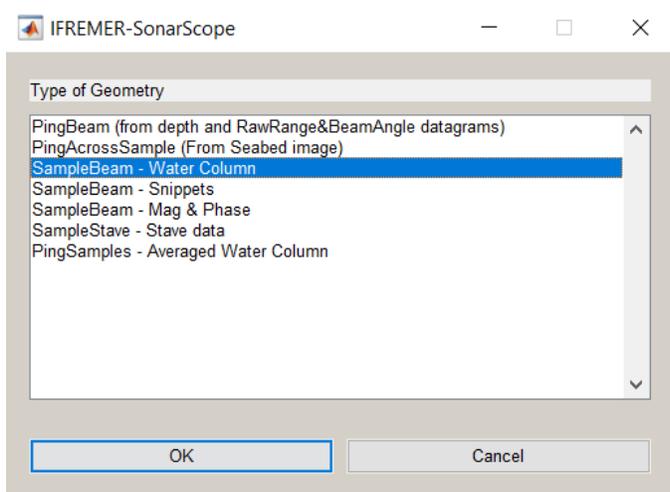
## 1. General Notes

- **Names** not too long and NO blank spaces in Names
- **Parallel processing** ON
- **2 Geometries**
  - Sample, beam → what the sounder delivers
  - Depth, across distance → display and interpretation
- **Cartographic parameters**
  - Determine once
  - Put in the same folder as the .all files
- In the beginning of the processing you will have to indicate the **frequency** that was used during the campaign:



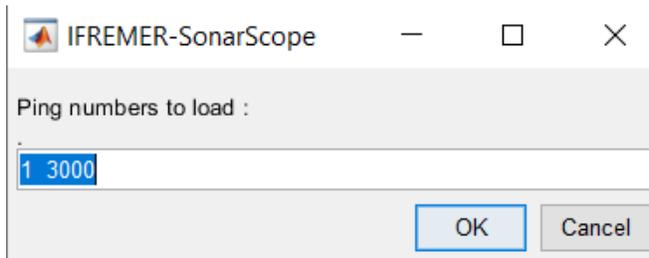
## 2. Check WC data

- Choose survey line(s) to check
- **File** – Import – Datafile - select “.all”  
Note: it is easier to import .all files separately
- Type of Geometry (select SampleBeam-Water column)

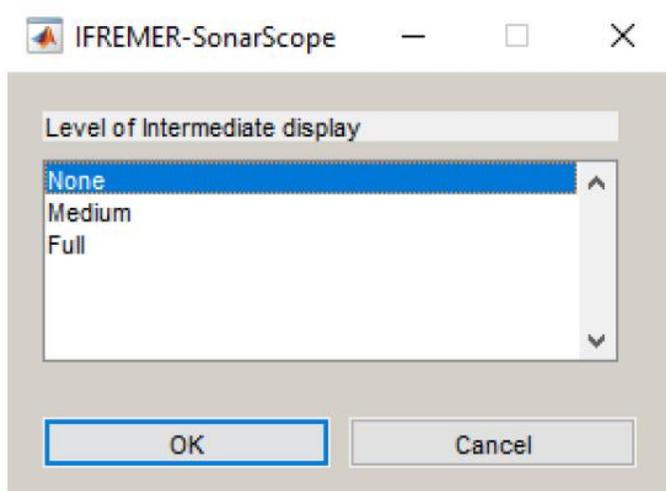


- OK
- Choose Ping number(s):

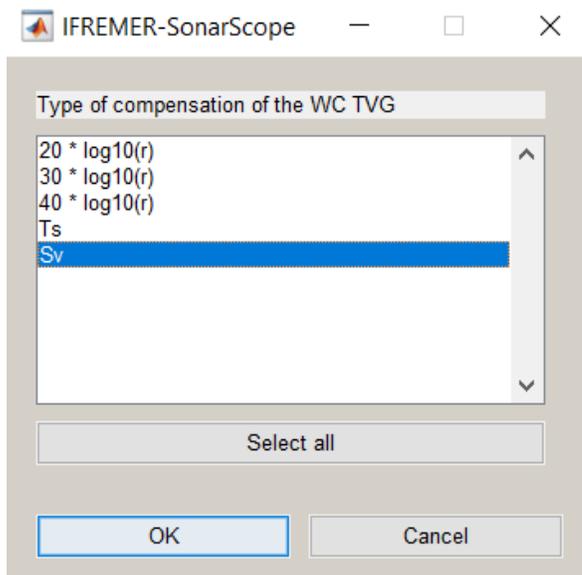
- By default: start ping to end ping of that survey line
- You can choose a random ping or several successive pings (Ping X: Ping Y)



- OK



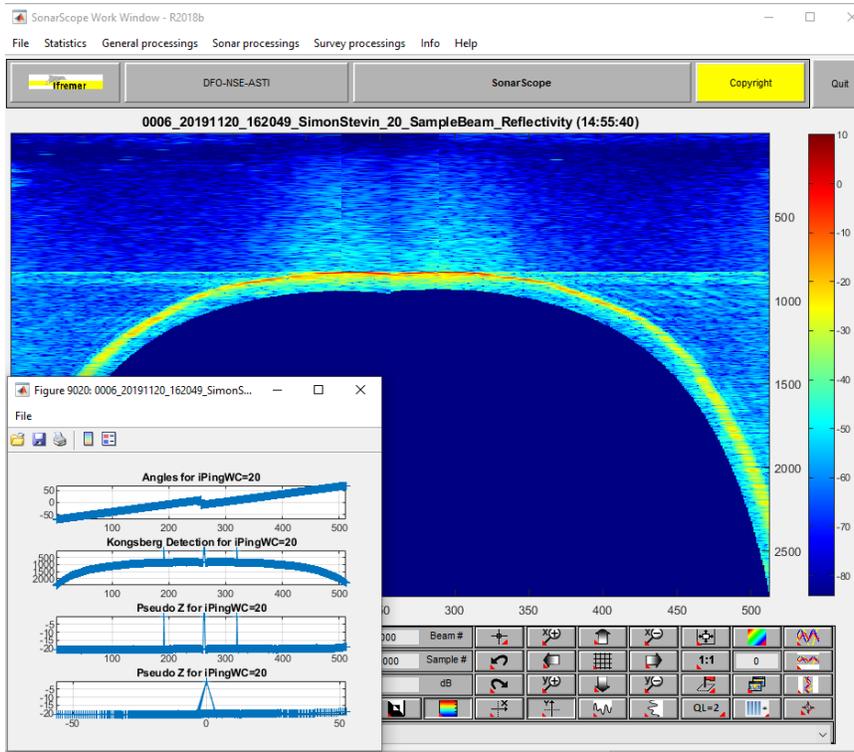
- OK



- SV – OK

Note: the difference between Sv and the others is that those logs can be used for target detection (single scatterers), while Sv represents db for a certain volume (db/m<sup>3</sup>), which is a better fit for the Timbers project.

⇒ RESULT: Display



Notes:

- Drag and Drop possible
- Possible to compare pings in same window

### 3. Bathymetry Data Cleaning (optional)

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At the moment not ideal to perform bathymetric data cleaning in SSc, so best to do this in Qimera (see separate manual) or skip this step (less important for TIMBERS).

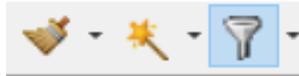
- **Survey Processing** - .all files – Datacleaning - (Different options)

Note: Maybe check after this step again the WC data to see any differences.

## 4. Tide correction

### 4.1 RTK processing

- **Survey Processing** - .all files – Tide – RTK - Check RTK heights - select all line(s) – OK
- **Input:** all the lines
- **In Signal ProcessingDialog:**
  - Filter data -> click on Height graph



- Order: 2
- Cutoff: 1/100-1/200 (Use same value for all the lines!)
- OK

#### Note:

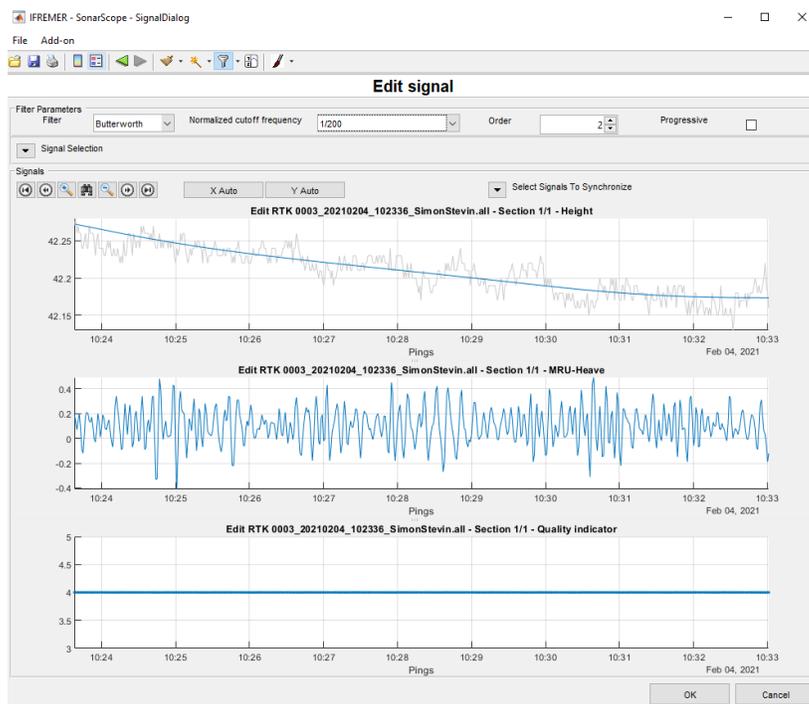
Heave: every 50 sec (50 hz) but not relevant because RTK used for tide compute

RTK: every sec at simon stevin

Waves: check time between peaks: around 60 sec

⇒ At least filter at 1/60 (1/100 or 1/200)

#### Example 04/02



- Ok, automatically the next line is loaded  
⇒ Result

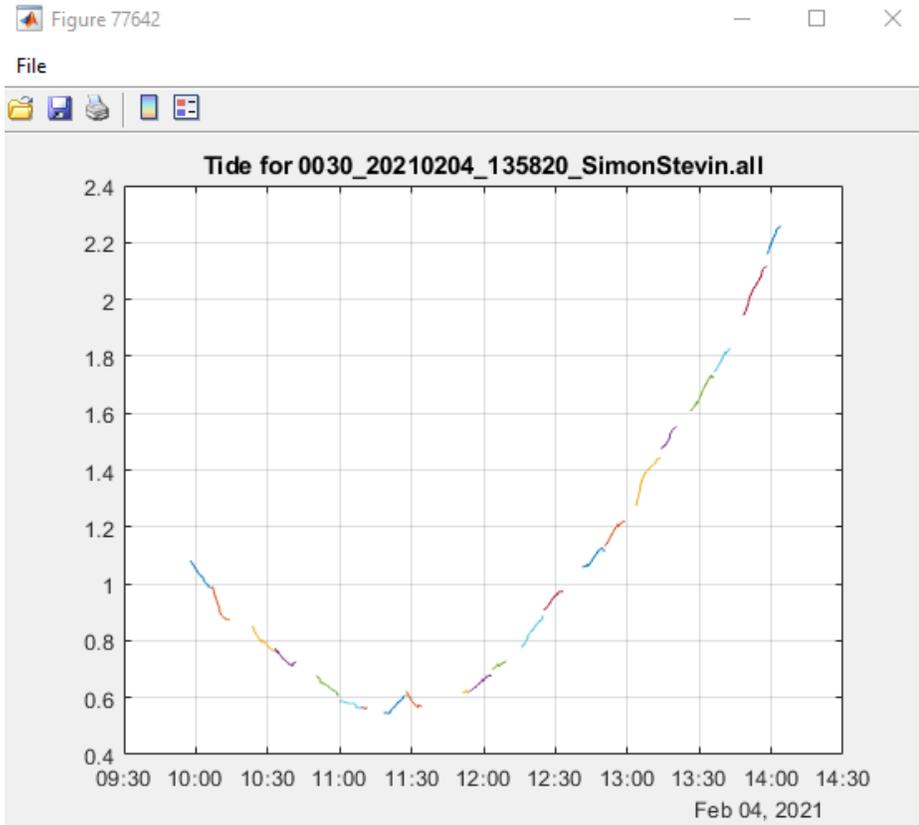
*Example 04/02*



## 4.2 Tide Compute

- **Survey Processing** - .all files - Tide - RTK - Compute Tide - select all lines - OK

*Example 04/02*



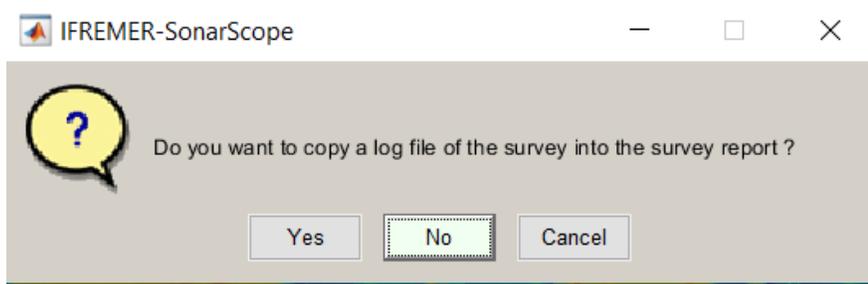
Notes:

- You can check if tide is indeed computed:
  - o Survey Processing-.all files-Tide-Plot Tide (z profile)
  - o Survey Processing-.all files-Navigation-Plot Navigation and Signal-Tide-OK (XY profile)

## 5. Survey Report (optional)

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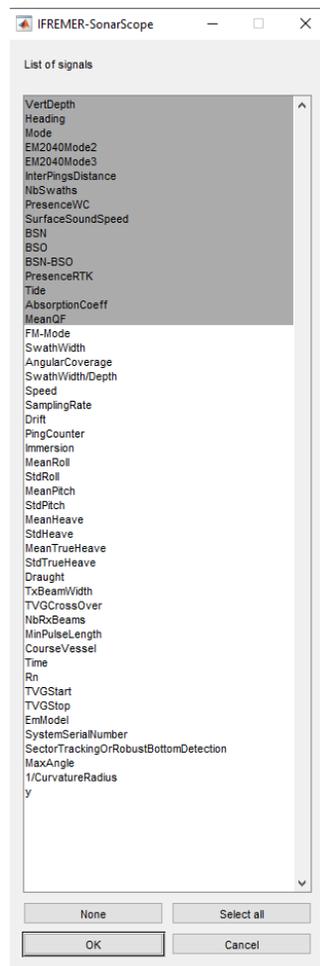
- **Create a framework: Survey Processing** - .all files - Survey Report - Create a Survey Report Framework
  - Select **Directory** – OK
  - **Name of the Survey** – OK
  - Name of the Website – OK



NO

⇒ RESULT: "Path\Surveyname.adoc"

- **Survey report in within the framework:** Summary of Lines + Navigation Plots + Sound Speed Profiles: **Survey Processing** - .all files - Survey Report - Step 1+2+3 at once
  - Select .all files – OK
  - Survey Report File Name (select the Adoc file)
  - List of signals (choose signals) – OK



Note: BSN (Backscatter: Normal Incidence) and BSO (Backscatter: Degrees)

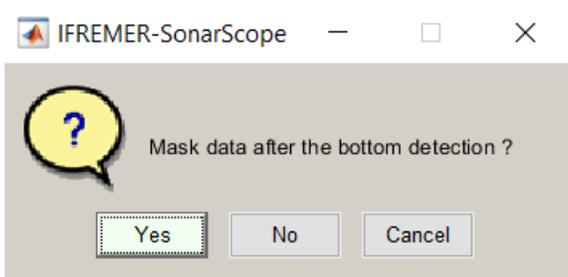
➔ RESULT: In Survey Report (asciidoc+html) + Folder Name SurveyReport (Summary of lines + excel; Navigation Plots+ Google Earths + Histograms; Sound Speed Profiles; ...)

- Add Figures Later: **Survey Processing** - .all files - Survey Report - Add Figures

## 6. WC Polar Echograms (only visualization)

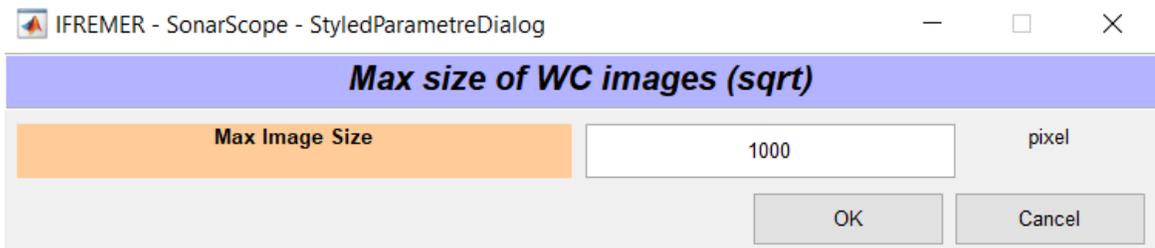
---

- **Survey Processing** - .all files - Water Column - WC polar Echograms
- Input: .all files (just a few files for visualization in 3D viewer)

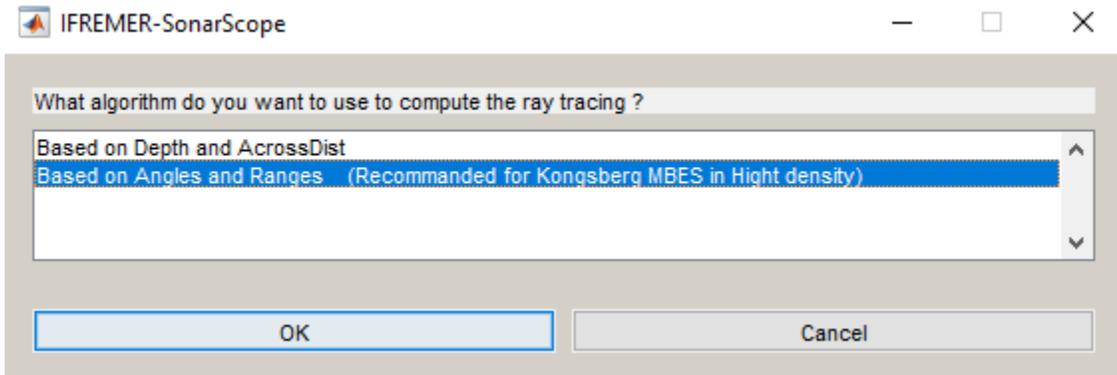


- Yes (especially if you display data later in Globe)

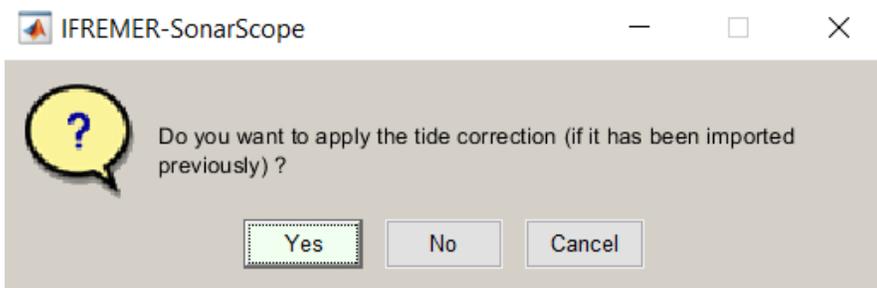
Note: Mask erases the data after the instant detections of the sounding. Disadvantage of mask: if the bathymetry was badly detected then masking is not good (low spikes in data cleaning dialog). Hence, data-cleaning bathymetry is necessary in some cases, but for TIMBERS project less relevant (select zone above the seafloor, however some large spikes are always better deleted).



- OK

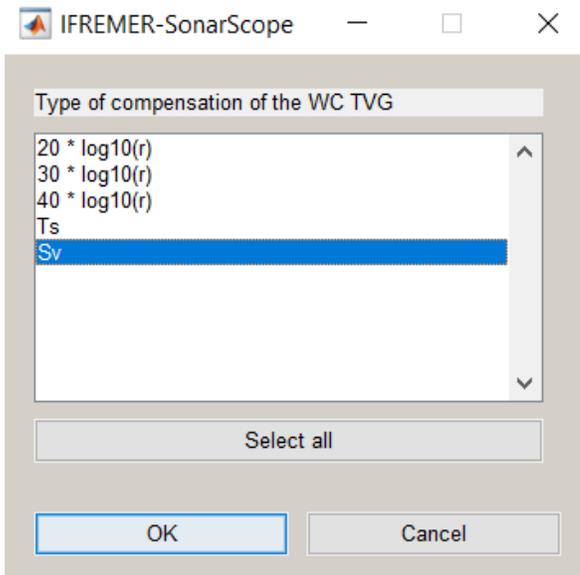


- Accept Algorithm proposed by Sonarscope



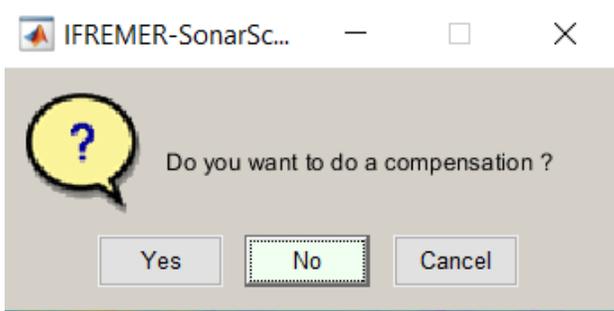
- Yes: important to let the WC data touch the seafloor in Globe

Note: In case you do not import tide but answer yes then SSc will put tide=0



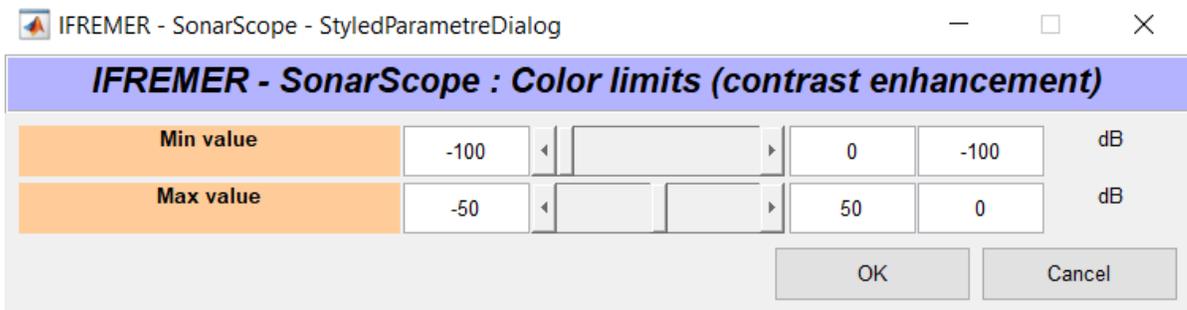
- SV – OK

Note: the difference between Sv and the others is that those logs can be used for target detection (single scatterers), while Sv represents db for a certain volume (db/m3), which is a better fit for the Timbers project.



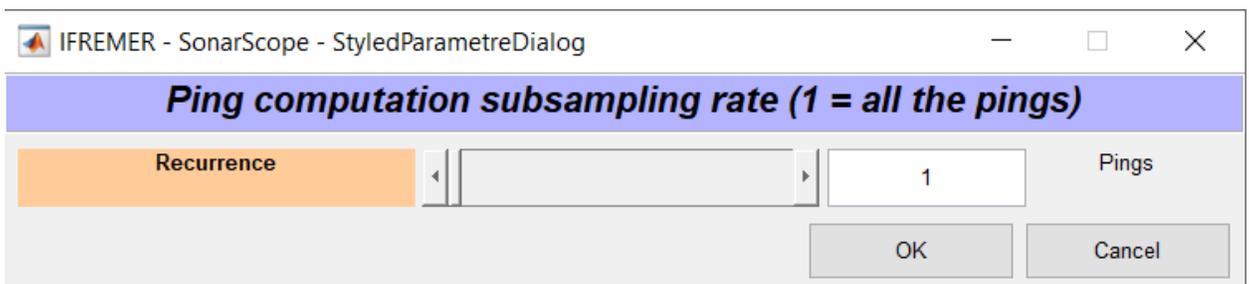
- No

Note: Same compensation as for 3D matrix, but not the same as for Echo integration, i.e. removing gain jumps between sectors and angular dependencies by calculation of compensation curves



- OK

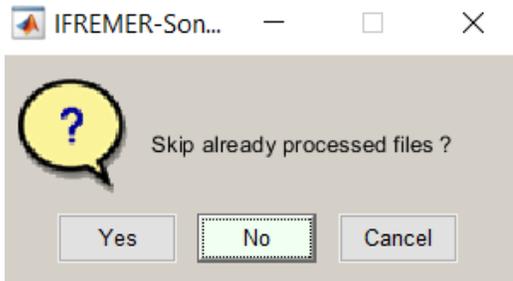
➔ Note: These values are only important if you want to import in Globe, because if you watch the PE in SSc then the complete range is used



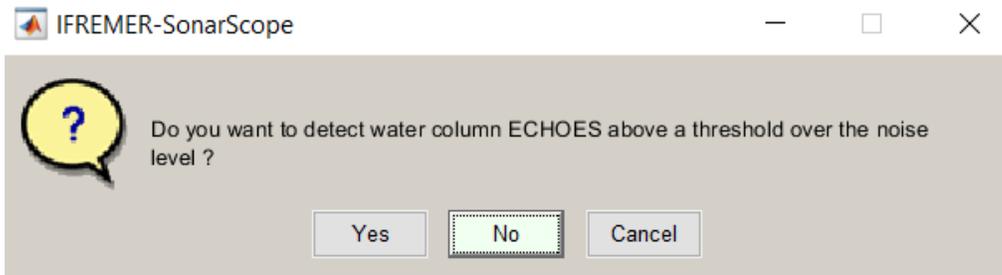
- Compute all pings ➔ 1 (Compute each n<sup>th</sup> ping: "n")



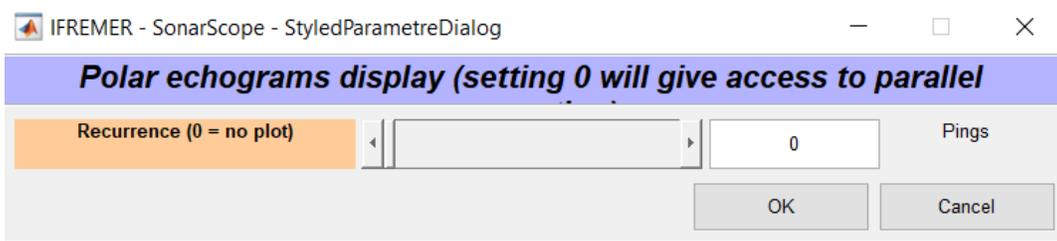
- No (yes if you want different versions/trials)
- Output Directory: "PolarEchograms"



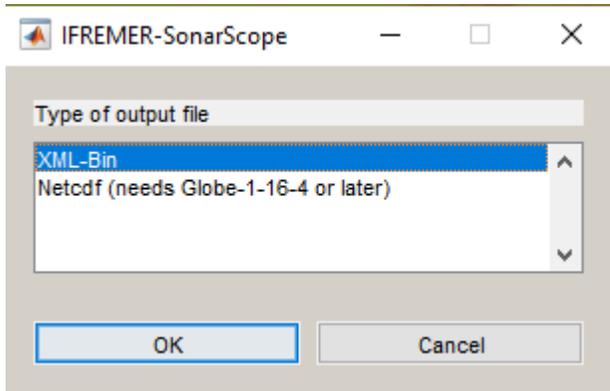
- No



- No
- **Choose pings for display**
  - If 0: parallel processing (no intermediate display)
  - If 20: Intermediate display
  - If 1: all pings will be displayed



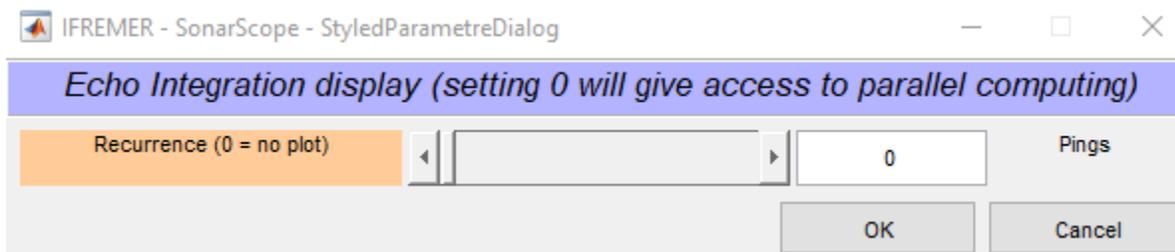
- OK



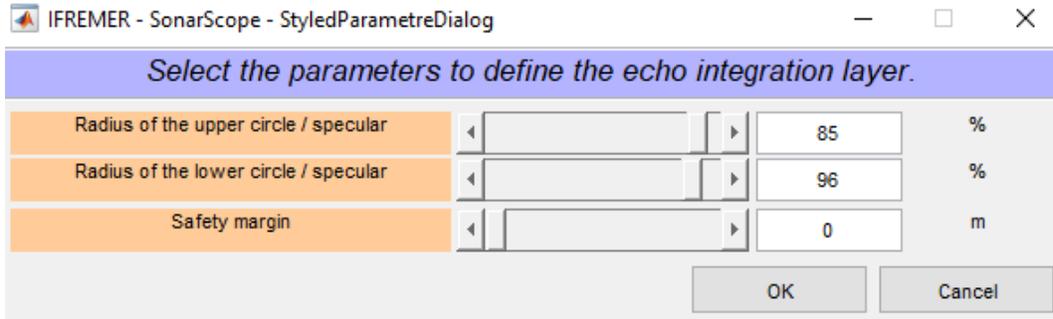
- ⇒ RESULT: In output directory: (**raw** and comp) Xml files + directories
- ⇒ Visualization in Globe

## 7. Export 3D point cloud in ASCII format

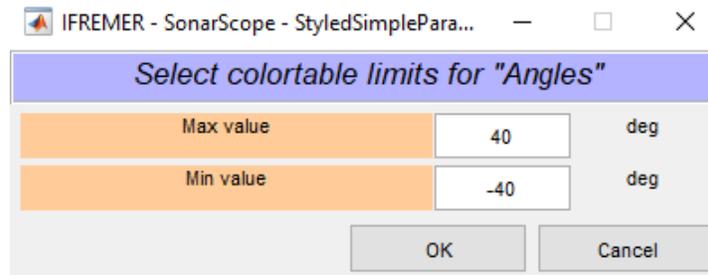
- **Survey Processing**-all files- Water Column-Appendices-Export WC-DepthAcrossDist over specular circle in ASCII
- **Input:** In Directory "PolarEchograms": \_Raw\_PolarEchograms.xml



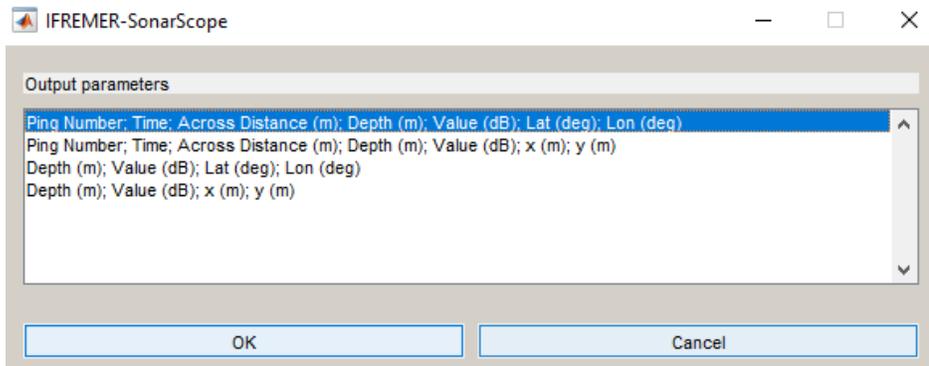
- OK



- Choose % of radius - OK



- Choose angle (65, -65) -OK



- Choose output parameters (option 3 and 4 will reduce processing time)-OK

⇒ RESULT: Csv file created in Directory where polar echograms are stored: -  
RawPolarEchograms.csv