

Ridge_BC_1998 Folder Description

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Main Folders:

- **Data:** Contains raw data and matlab-format (.mat) files
- **Docs:** Contains field logs to explain the raw data and other documentation.
- **GPS:** Contains Static and Kinematic processed GPS data from the cross-dome profiles
- **Matlab_scripts:** Contains all the matlab script files to load and plot the data
- **Plots:** Contains postscript versions of the plots and also the associated matlab files (.m and .mat) that can be used to automatically re-generate the plot.
- **RBC_layermodel:** Layer Model files. I have made no attempt to clean this folder up.
- **Satellite_images:** contains annotated AVHRR images that show the ridges, ice streams, and the radar profiles. Files with extension .idr are Island Draw files. The file rbc_prof_key.idr will show the satellite image annotated with labels for all of the RES profiles.

Profile Names:

Main cross-margin profiles are named BmarE, BmarC, and BmarW for the East, Central, and Western crossings of Ice Stream B. Profiles across the Eye feature are named "eye**". The long profile across the divide is named RBC_all or RBCcamptoISC. Profiles parallel to the margin are referred to as BparaN and BparaS for north and south profiles.

Data files (in Data Folder):

Most of the plotting routines work from the raw data. The plot script concatenates the files, performs bandpass filtering, and corrects for inconsistencies in pressure. I have saved most of the final assembled and filtered profiles that were used for layer picking. Data for the picked layers is saved in a separate file, usually with the same name:

Image Data:

- Cross Margin: BmarC_stack.mat, bmarE.mat, bmarW.mat
- Other: Eye_data.mat, RBC_camptoISC_imagedata_s2 and s4.mat (s2 and s4 refer to the number of raw waveform points averaged in the file. S4 is half the size of s2.)

Relevant Matlab Variables:

There may be a few other variables, but these are the important ones.

Hpos	Horizontal position (m)
Time	Travel time (s)
Filtdata	Matrix of filtered data

Pressure	Pressure record
Depth	Depth corresponding to travel time using 84m/us
Low/High_Corner_Freq	Frequencies used for the Butterworth filter
Xinc	scope sweep speed (horizontal scale)
Yinc	scope vertical scale (volts)
Averages	Number of stacks for each measurement
BikeCount	Number of ticks from the bike wheel.

Layer Data:

- Cross Margin: BmarC_layers.mat, BmarE_layers.mat, BmarW_layers.mat
- Other: Eye_layers.mat, RBClayers_all.mat eyelayers_all.mat

Relevant Matlab Variables Common to all Layer Data files: The dimensions of these should correspond to the image data.

Hpos	Horizontal position (should be the same as the image data).
Bed_pick	Travel time for bed reflection
Bed_val	bed reflection amplitude in milivolts
Layer1	Travel time for layer1
Layer1_val	reflection amplitude for layer 1 in milivolts

Matlab variables specific to RBClayers_all.mat and eyelayers_all.mat

Layer_depth_ieq	Matrix of ice-equivalent layer depth in ice equivalent (based on assumed density profile in dens_prof.m calculation. Row = layer number, Column = Horizontal position corresponding to Hpos. Last row contains values for the bed.
Layer_depth_true	Matrix of layer true depth
Layer_depth_true_smooth	Matrix of depth for horizontally smoothed layers.
Layer_time	Travel time matrix for each layer
Valall	Matrix of reflection amplitudes for each layer.

Notes: RBClayers_all.mat includes 13 picked layers across Ridge BC profile that went through camp. It includes layers that I could track through the Ice Stream Margin. Therefore the dimensions will not exactly match with the image data, as I did this by brute force one day. Layers from the main divide area were from data in RBC_camptoISC_imagedata_s2.mat, and layers from the margin area were picked from data in BmarC_stack.mat.

Eyelayers_all.mat includes data from both the Eye feature (eye_data) and from the ice stream margin (bmarW_data). The variable “valall” contains only 6 layers because the deepest layer was too rough to get a good measure of the reflection amplitude.

Plotting routines (in Matlab Scripts Folder)

The plot routines in this folder are pretty much self explanatory. The routines that DON'T begin with PLOT are matlab scripts that are used within the plotting routines. Do not remove them from this folder.

Cross_margin Profiles

Plot_BmarC.m Plots the image, corrected for surface elevation.

Plot_BmarC_imagebedpwr Plots the image in the upper plot, and the normalized bed reflection power in the lower plot

Plot_bmarC_layers Line plot of the picked layer depth vs horizontal position.

Plot_camp_layers_andbedpower Line plot of picked layers and bed reflection power.

Plot_all_RBC_margins. Plots all 3 cross margin profiles images in one plot.

RBC cross ridge profiles

Plot_BC_ridge_nostack/stack2/stack4, Plots the RBC image, corrected for surface elevation, using various stacking parameters. Data were collected at very close spacing, (about 10 meters I think), so using the stack2 and stack4 options makes plotting faster. Layers were picked using the stack2 option. The nostack option takes forever and uses a lot of memory.

Plot_BC_ridge_layers. Plots the picked layers from the RBC cross-ridge profile.

Eye profiles

Plot_eye and plot_eye_stack: Plots the image from the eye feature (stack means every 2 waveforms are stacked).

Plot_eye_layers_andbedpower Line plot of picked layers and bed reflection power.

Plot_eye_east and plot_eye_east_stack. Plots the image from the eastern crossing of the eye feature.

Other:

Plot_normpwr_cmp.m Plots the picked layers for the “camp” cross-ridge profile, calculates the power returned from the layers, and plots the variation in reflected power for each layer.

Plot_normpwr_eye.m Same as above except for the Eye profile.

Fit_amplitude_depth.m: plots the bed reflection amplitude vs depth (travel time) for both the eye profile and the camp profile. Calculates coefficients for an exponential

relationship between traveltime and amplitude. These coefficients are used in all the normalized bed power calculations.

Plot_BparaN and Plot_bparaS.m These are profiles that run parallel to the ISB margin.