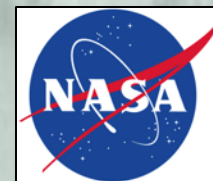# PICKGUI: Tracing radar reflectors in MATLAB

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Motivation for a MATLAB solution

Recognizing that is no clear winner as a comprehensive tool for tracing a large amount of radiostratigraphy and then doing something with it

- KU Greenland radar data already available in MATLAB's .mat format
- Challenges associated with importing/exporting into various seismic software packages
- Recent development of novel methods for predicting reflector morphology
- Relatively easy GUI development
- Fear the black box
- Need for efficient workflow between reflector tracing, dating, ice-flow modeling and echo-intensity analysis

Ultimately, we are tracing lines on images, which isn't that hard, but organizing those lines making geophysical sense of them *is* hard
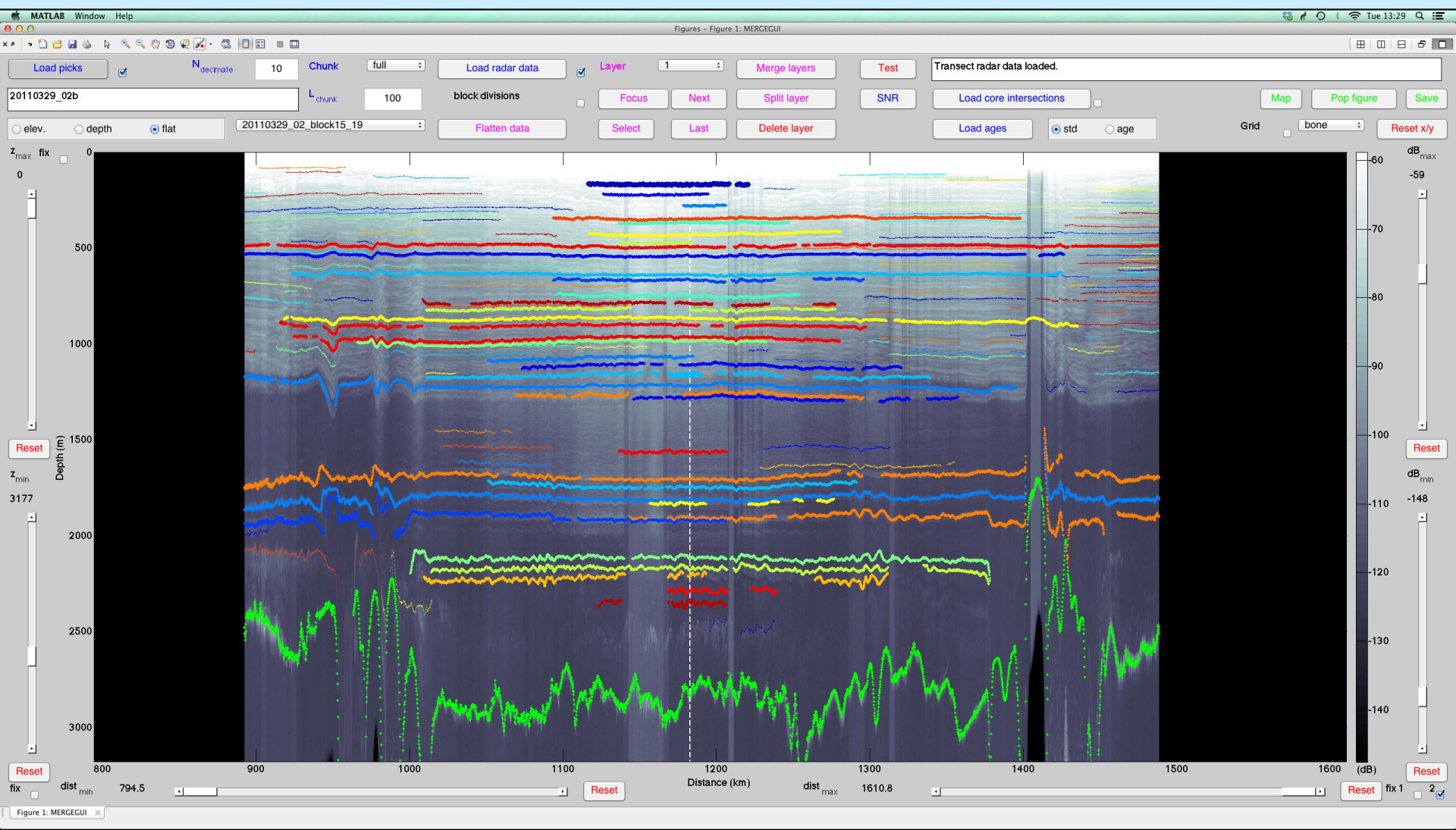
PICKGUI pros/cons

Pros

- Free as in MATLAB

- Flexible and user-extensible

- Reasonably documented and commented, but not exhaustively so

- Emphasis on QC: Anyone can pick a layer, but believing a layer is harder

- Code repository on Github makes forking/merging easy

- Traced lots of Greenland radiostratigraphy successfully, i.e., it works

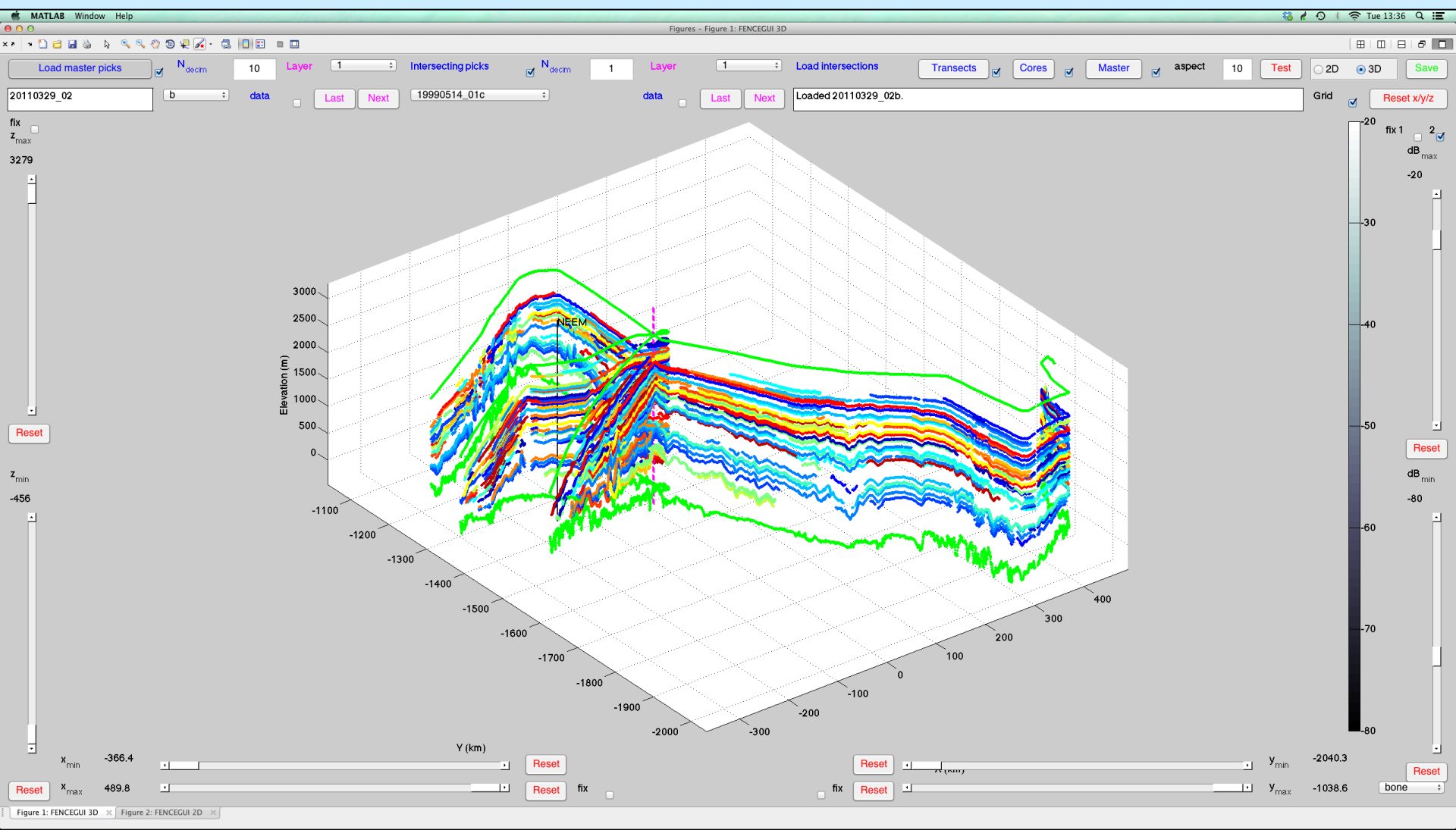- Could easily be extended to include cluttergrams

Cons

- I am currently the only developer

- Functionality satisfies current interests (terrestrial IPR data)

- Modification to work with SHARAD data requires support ($) or a suitably motivated researcher

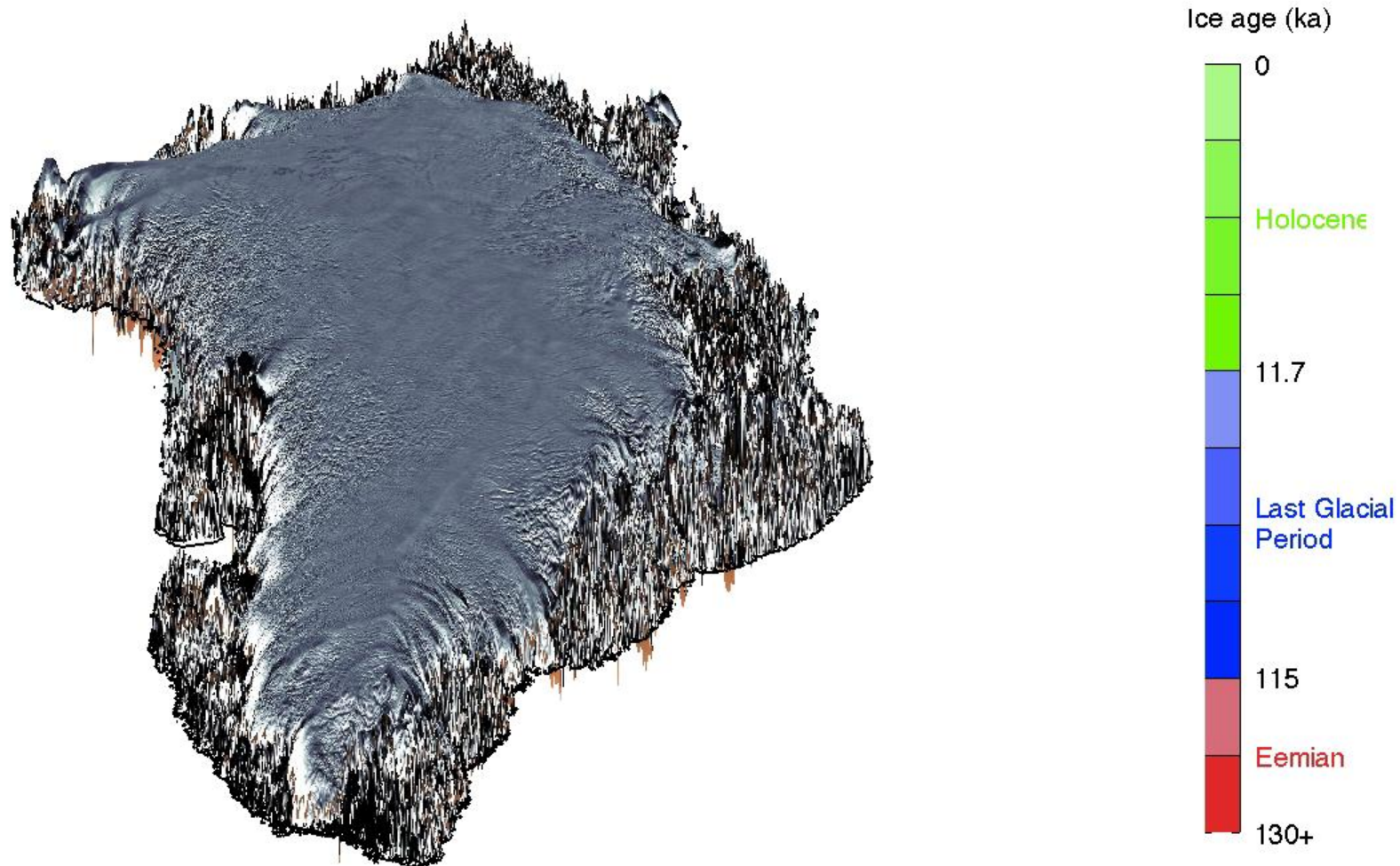- Mapping, Signal Processing and Image Processing Toolboxes strongly recommended

Example tracing of a ~50-km segment

1. **Predict**
2. **Flatten**
3. **Trace**

Example QC of hundreds of kilometers of data

Example matching of layers between transects

Age structure of the Greenland Ice Sheet

Ice age (ka)

0

Holocene

11.7

Last Glacial
Period

115

Eemian

130+

Ice-sheet surface and bed elevation and masks from *Bamber et al.* [2013, The Cryosphere]
MODIS Mosaic of Greenland from J.A. Bohlander and T.A. Scambos

Interested?

Two options:

- Contact me:
  joemac@ig.utexas.edu

- Download from Github:
  https://github.com/
      joemacgregor/pickgui