

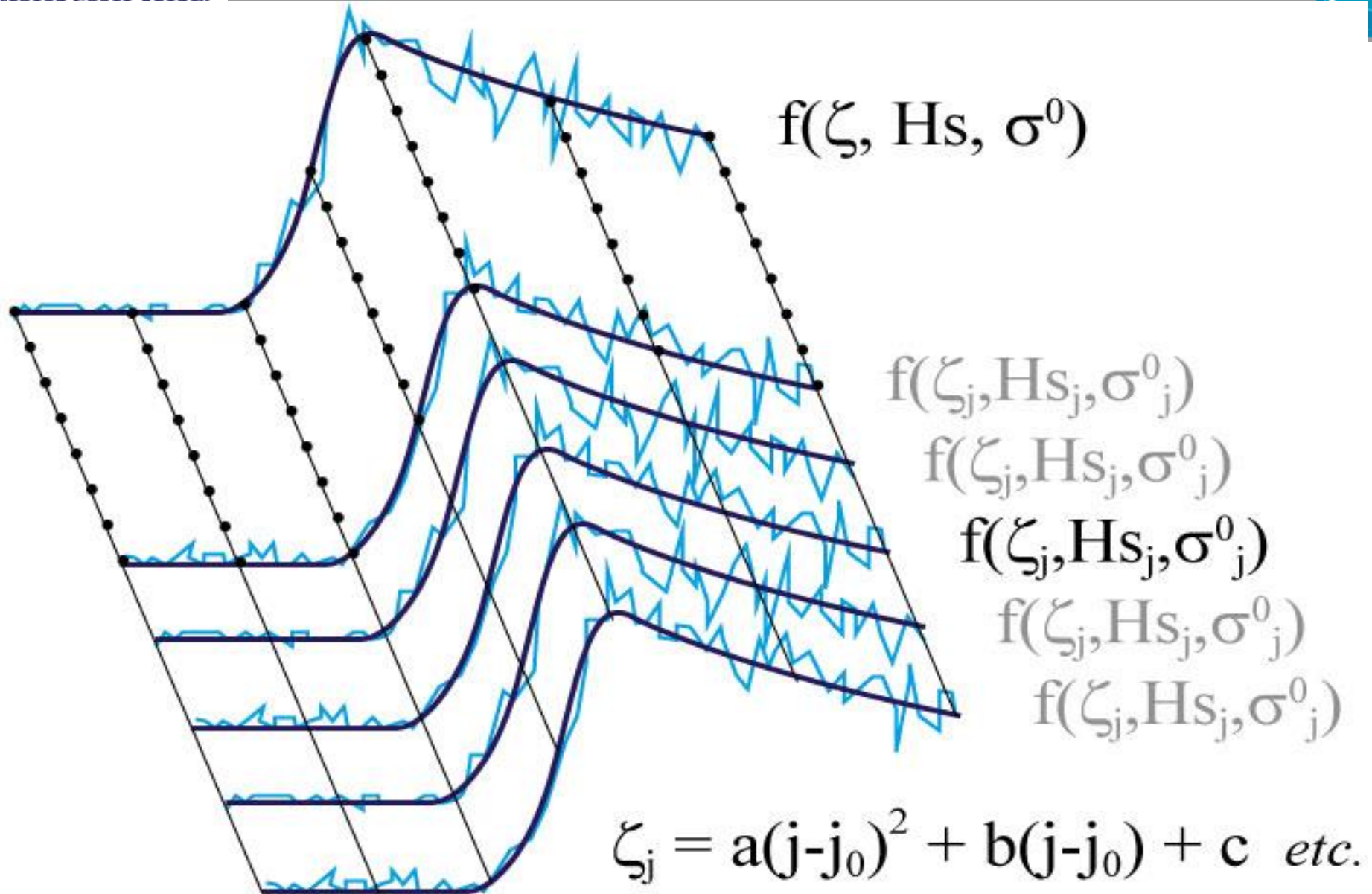


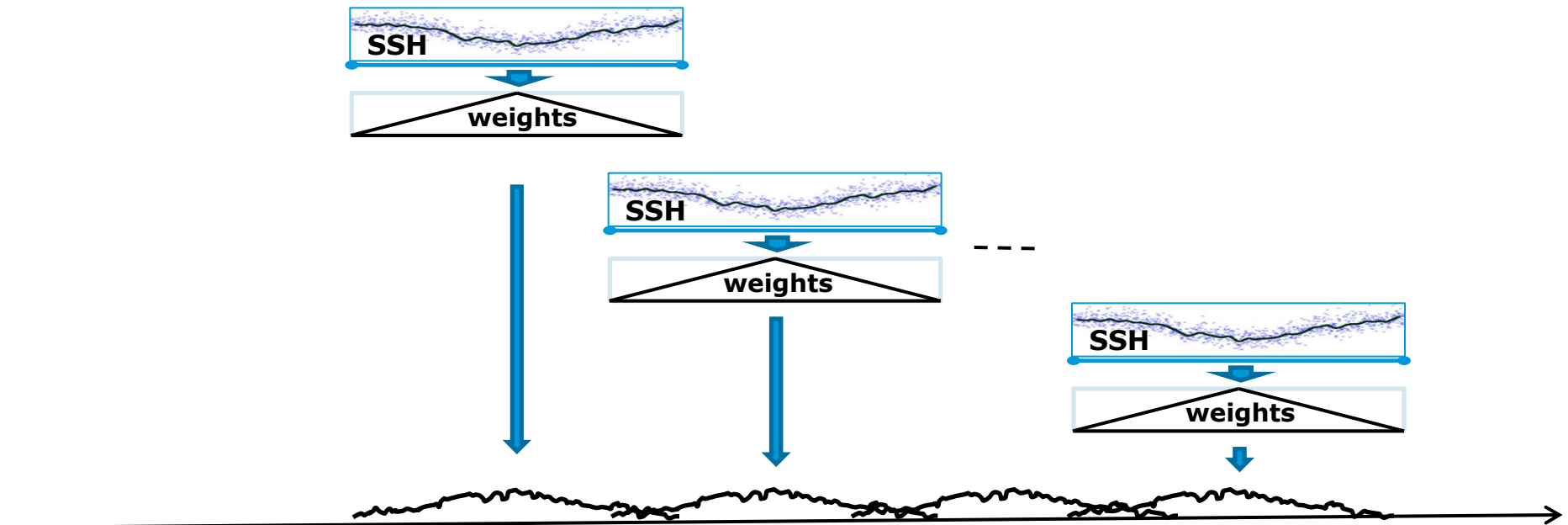
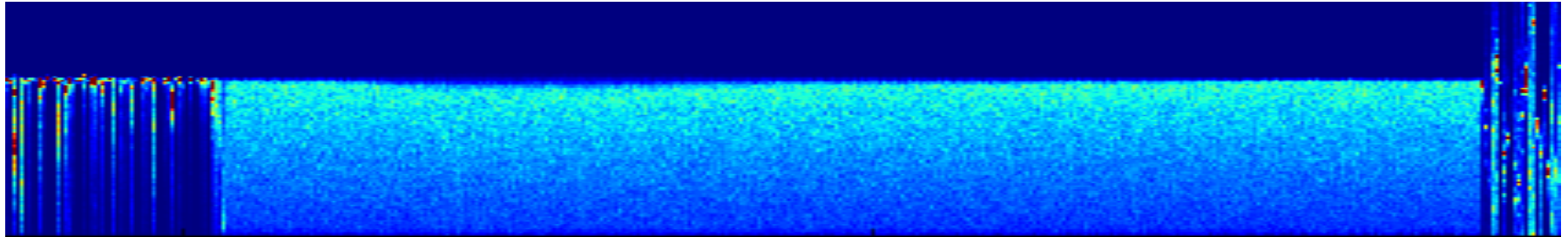
Sea Level CCI project

PM6: Evaluation of 2-D retracker

G.D. Quartly & A. Kurekin (PML)

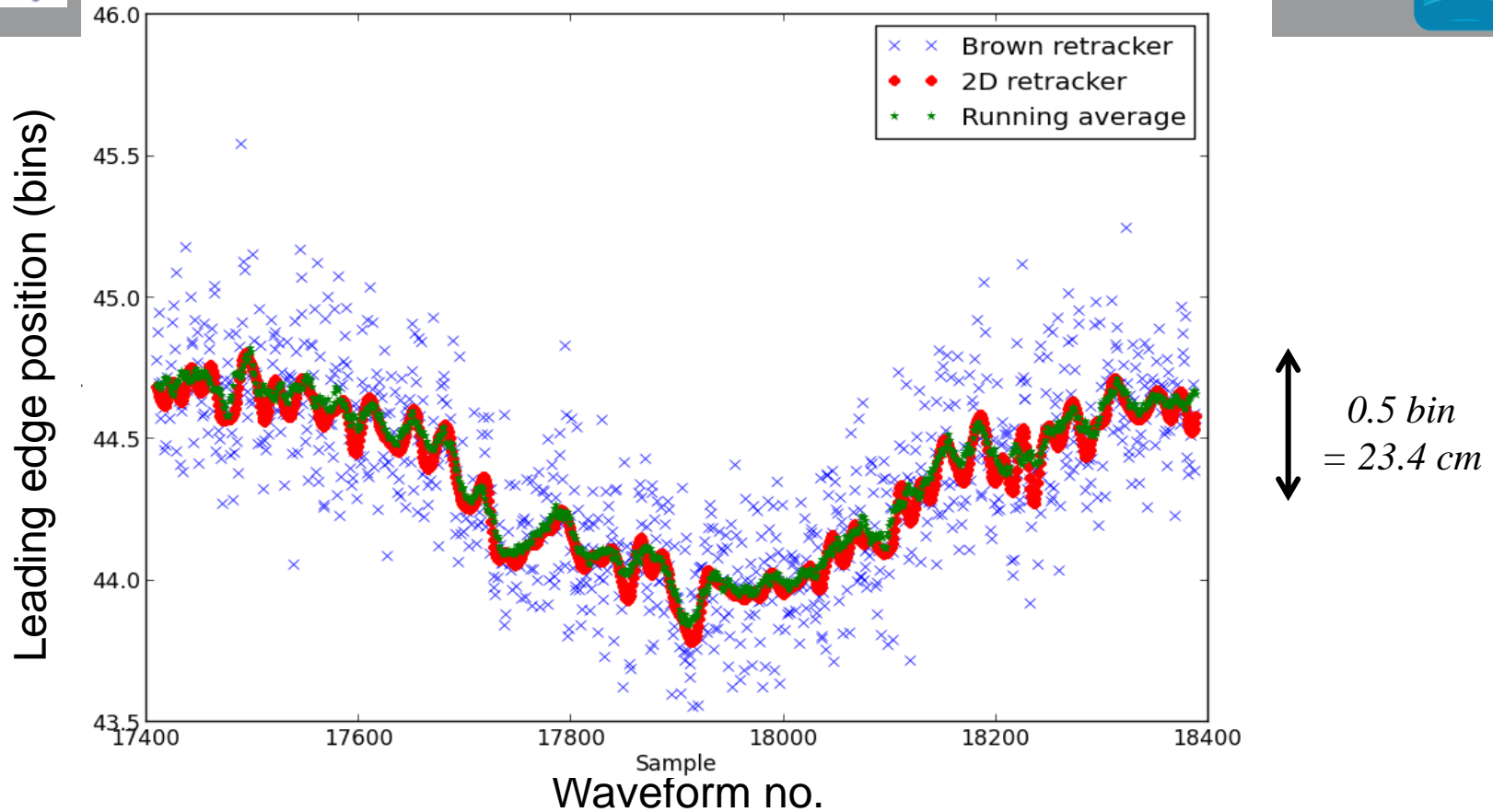








- Waveform-fitting by minimising sum of squares of (obs – model)
- Minimum located by Levenberg-Marquardt search
- Iteration terminates when relative error < threshold OR maximum number of iterations reached
- Coded in python
- Typical runtime for block of 21 waveforms 76.7ms (compared to 2.4ms for 1D retracker) solving 1 waveform
- For block of 21 waveforms and moving window by 11 waveforms the runtime is 7.4ms ($\sim 3 \times$ 1D retracker time)



Negligible mean bias between retrackers

Scatter of individual 20 Hz 1-D retracker about 2D: 8.78 cm

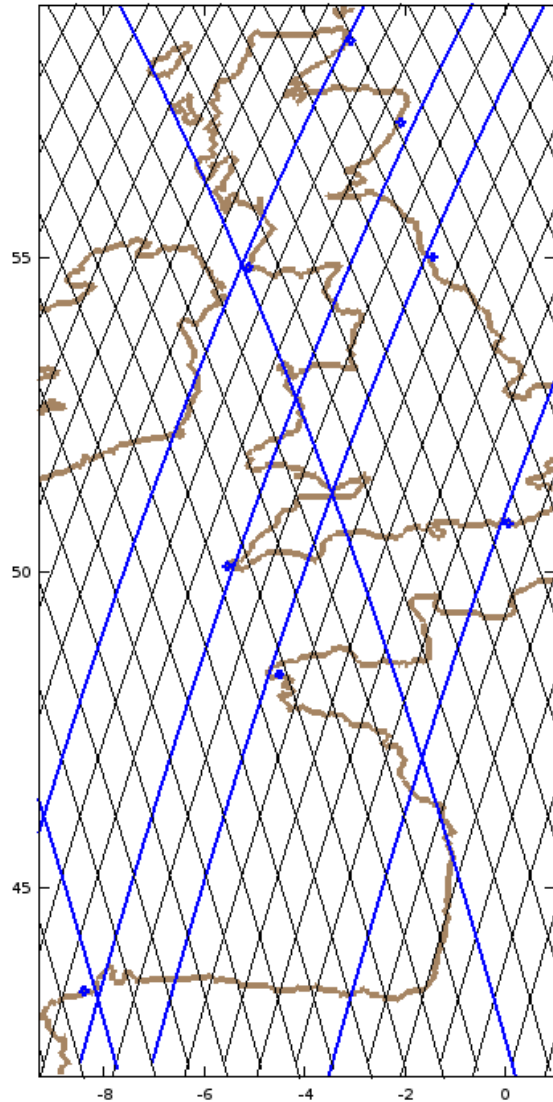
Scatter of 21-point smoothed 1-D retracker about 2D: 2.08 cm

2-D retracker fits a quadratic through leading edge; consequently it gives a smoothing performance similar to a smaller running average

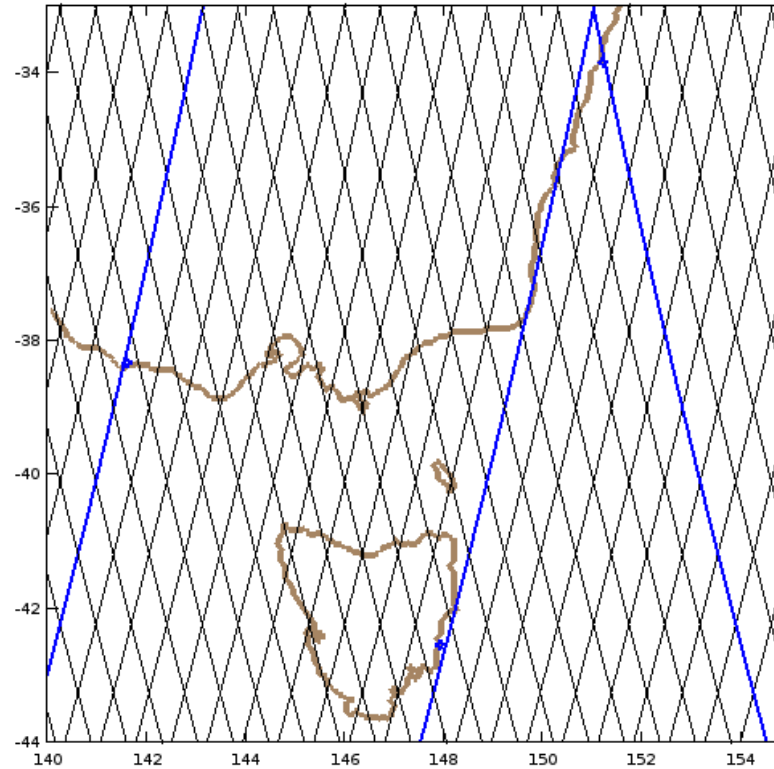
TG Validation Sites



Region A



Region B



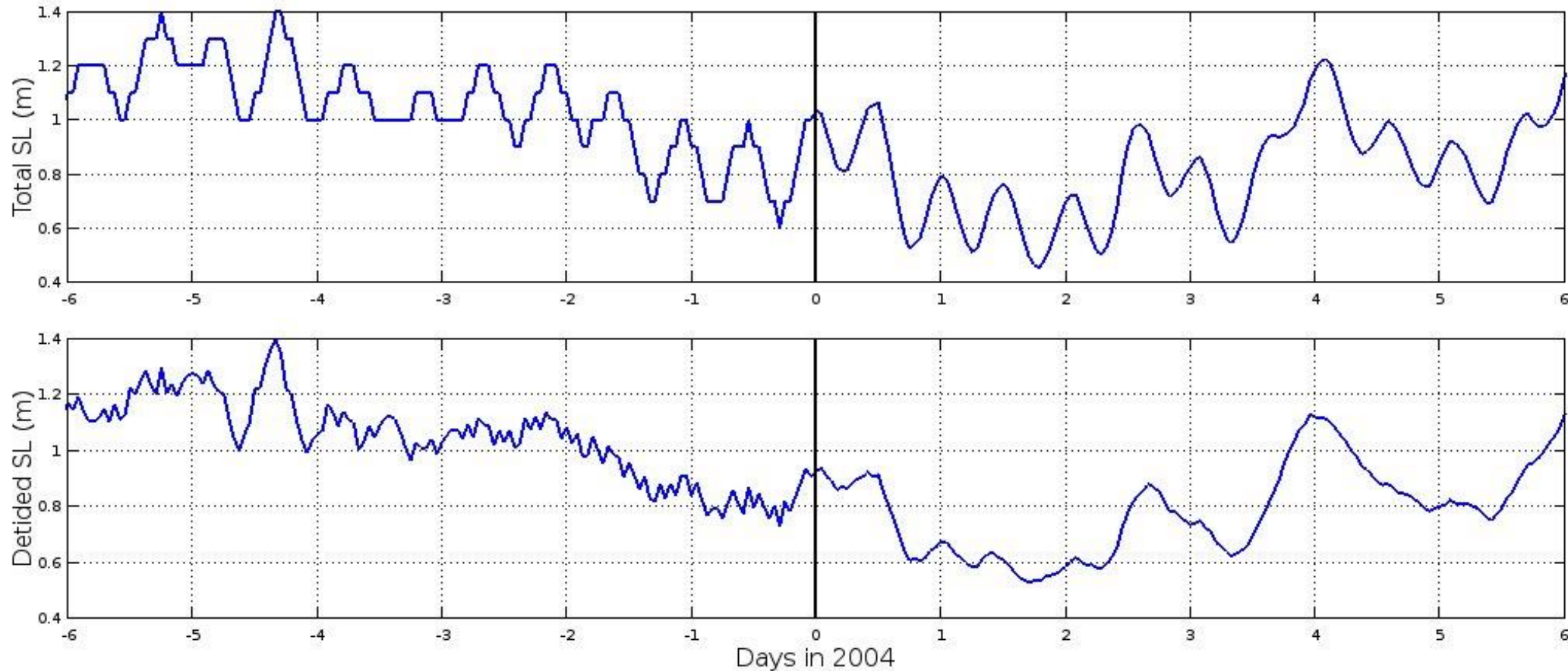
Tide gauge data from 11/12 sites provided by BODC & U. of Hawaii sea level center
Data quality-controlled by Francisco Calafat (NOC)

→ Total SL, Tidal res. & DAC-corrected

Tregde quantization



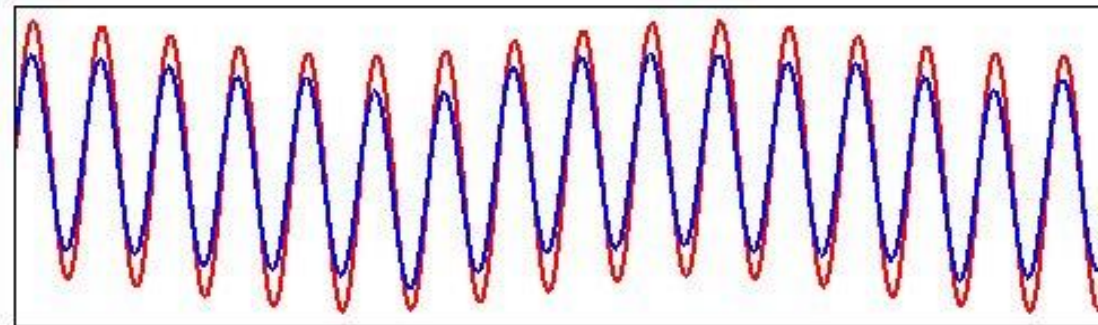
Tregde





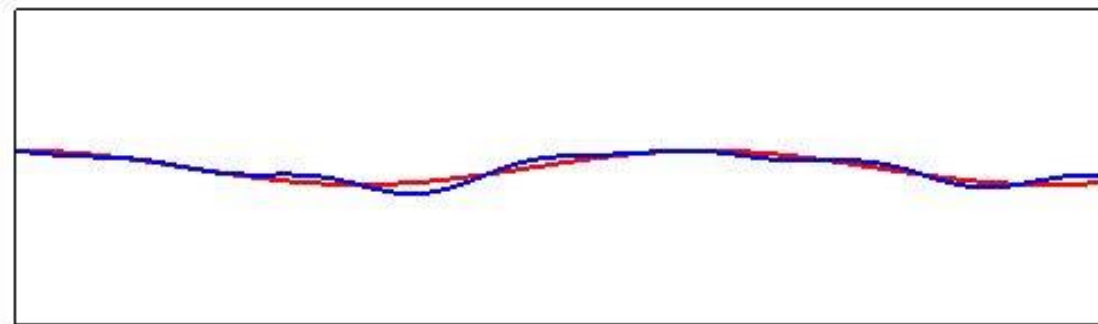
(Simulated data)

Total SL



Tide Gauge
Altimeter

Tidal res.



→ S.D. of difference after tidal correction

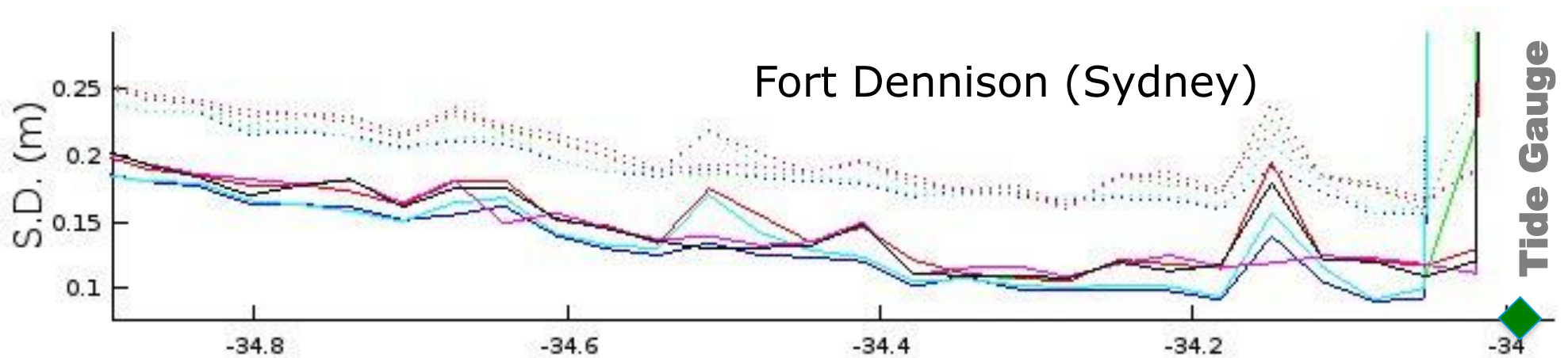
Multiple retrackerers



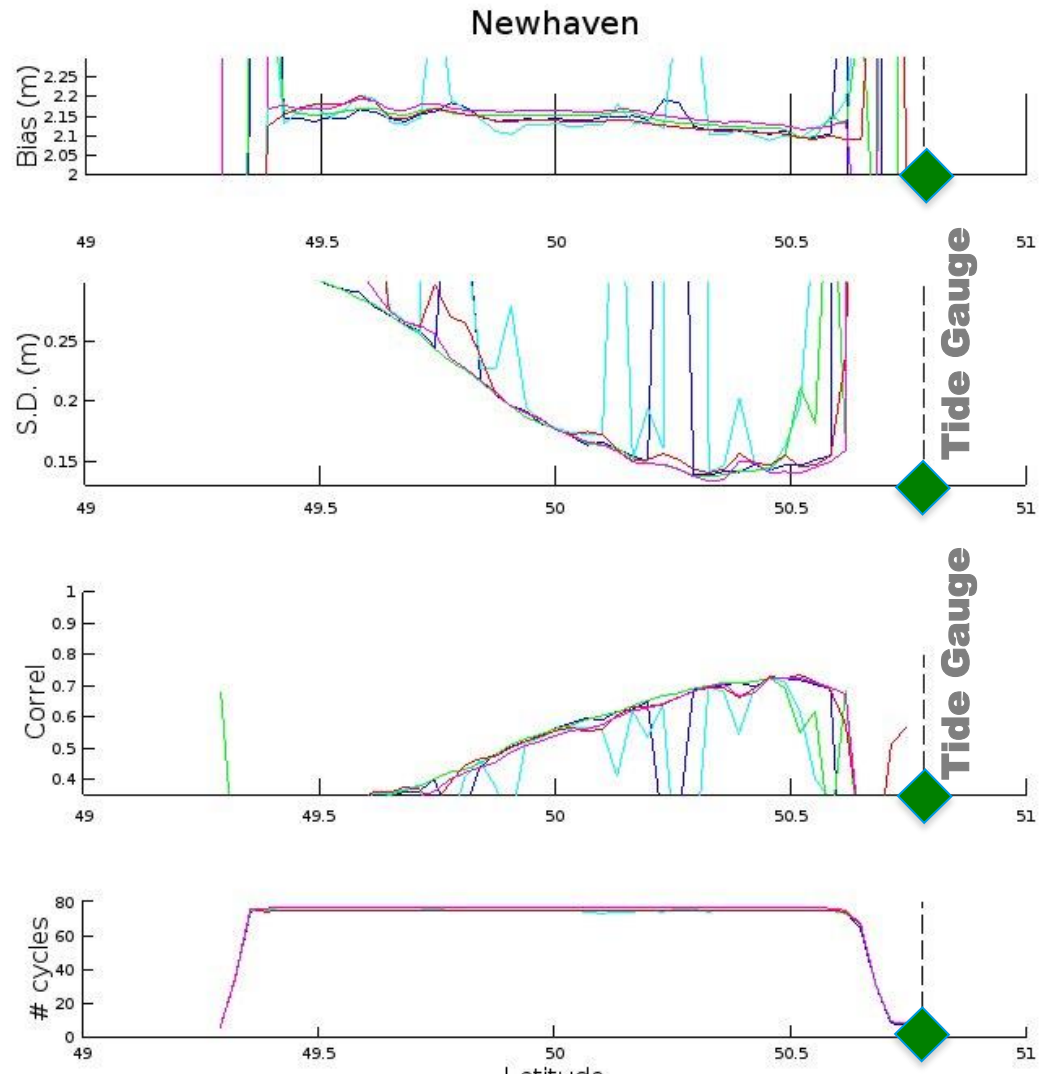
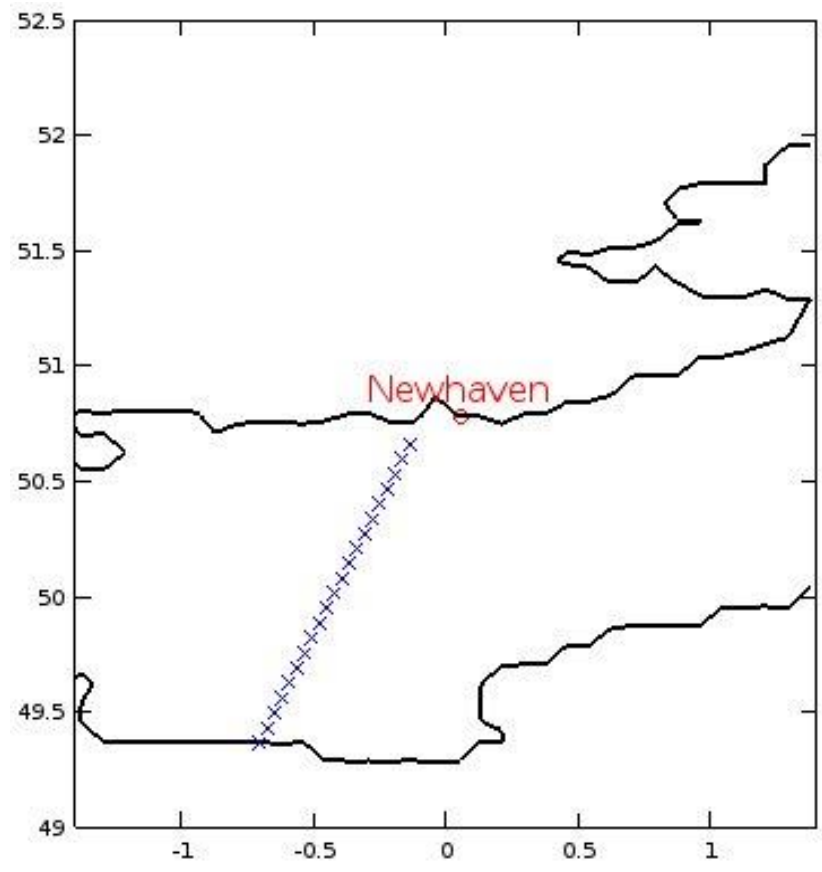
2D_Brown

21-point smoothed
Brown

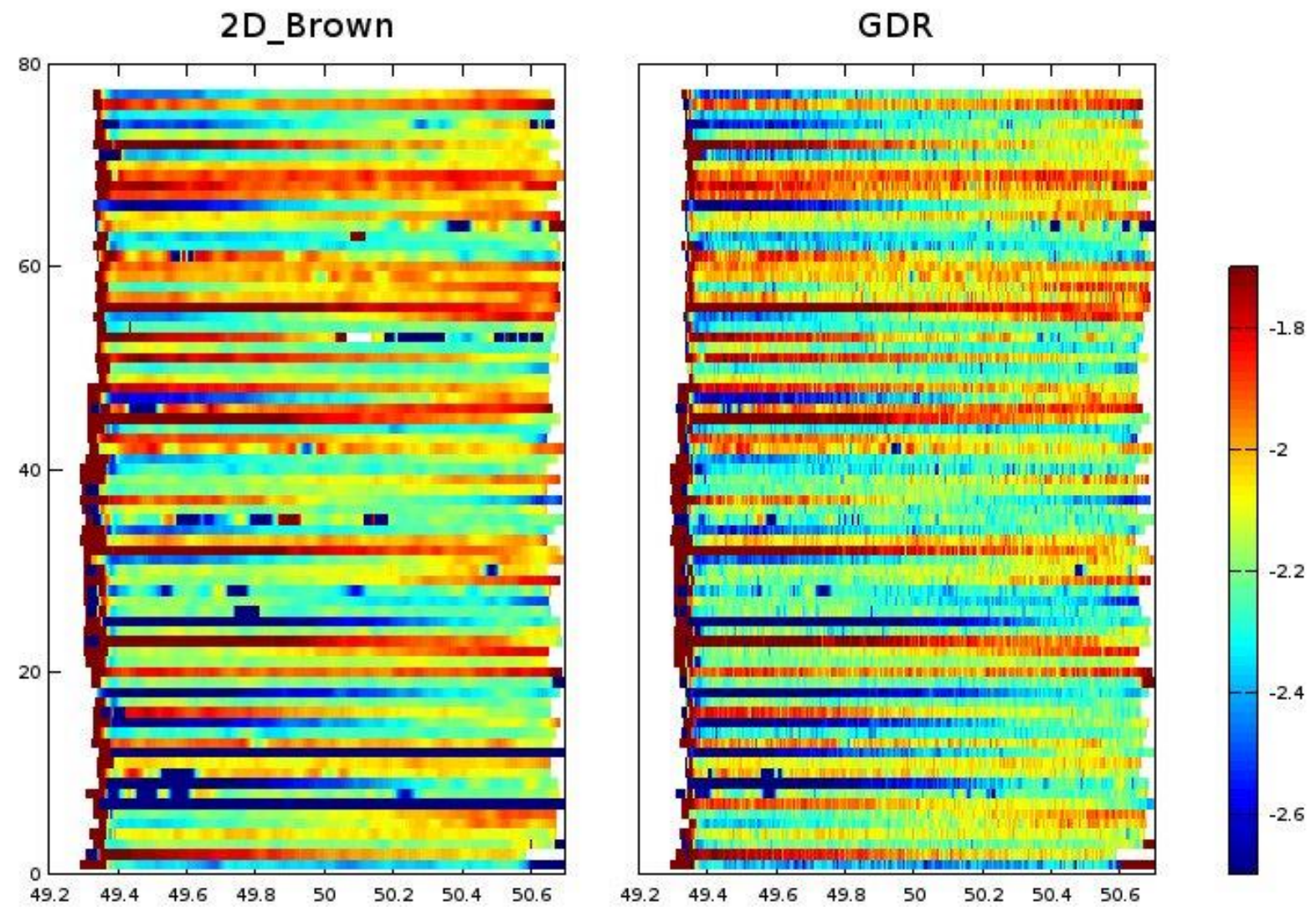
GDR



TG Validation : Newhaven



TG Validation : Newhaven





Implementation

- Code works well in open ocean
- Run time ~ 3 x standard processing
- Also produced a 2D_ALES

Validation problems

- Tide Gauge quantization
- At present tides removed, but not DAC
- Interpretation of mal-adjusted waveforms

Coastal retracker

- ALES successfully implemented

Robustness?

- At present, 2D retrackers strongly affected by rare bad waveforms
- Will adaptive editing of accepted waveforms for 2D be better than a resilient running filter on 1D?

