

# Summary of jincheng2\_2\_20-bs

Run date: 2024-04-26 20:02:56.594376

Time cost: 17.61 s

## BASIC INFORMATION

Environment condition:

- temperature (°C): 26.0
- salinity (ppt): 28.0
- depth (m): 5.0
- pH: 8.0

Raw waterfall:

- frequency (kHz): 20
- slant range (m): 80.0
- sample count: 1736
- ping count: 952

NMEA:

- planned speed (knot): 4.0
- recorded speed (knot): mean=3.4, std=0.3, min=2.5, max=3.7
- raw tow fish geographic coordinates:
  - min-max longitude=120.06227-120.06437
  - min-max latitude=37.43966-37.43967
- ping direction type: cog
- raw ping direction (degree): mean=None, std=None, min=None, max=None
- smoothed ping direction(degree): mean=None, std=None, min=None, max=None

Tow fish:

- port altitude (m): mean=-3.2, std=0.5, min=-4.3, max=-2.4
- starboard altitude (m): mean=-3.2, std=0.5, min=-4.3, max=-2.4

Geocoding mosaic:

- resolution (m/pixel): 0.1
- geographic EPSG: 4490, projected EPSG: 4499
- survey line length (smoothed, m): 187.8
- flat swath (port+starboard, m): min-max=159.8-159.9
- scanning area (square meter): 29242.7

## PROCESSING PARAMETERS

TVG enhancement:

- lambda: 20.0
- Bottom detection:
- gradient\_thred\_factor: 0.1
  - win\_h: 10
  - use\_ab\_line\_correction: 0
  - peak\_factor: 0.7
  - valley\_std: 5

Slant correction:

- bottom\_offset: [2, 5]

Gray enhancement:

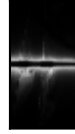
- gray\_enhance\_method: coarse2fine
- gaussian\_kernel: 50
- gain: 10.0
- alpha: 0.05
- ratio: 0.02
- prob\_thred: 0.3

Geocoding:

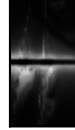
- is\_ns: 1
- fish\_trajectory\_smooth\_type: bspline
- fish\_trajectory\_smooth\_factor: 80.0
- angle: cog
- angle\_smooth\_factor: 10.0

# Waterfall after each processing step

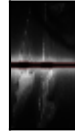
Raw waterfall



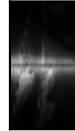
TVG enhanced waterfall



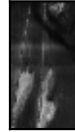
Waterfall with bottom line



Slant corrected waterfall



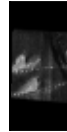
Gray enhanced waterfall



Speed corrected waterfall

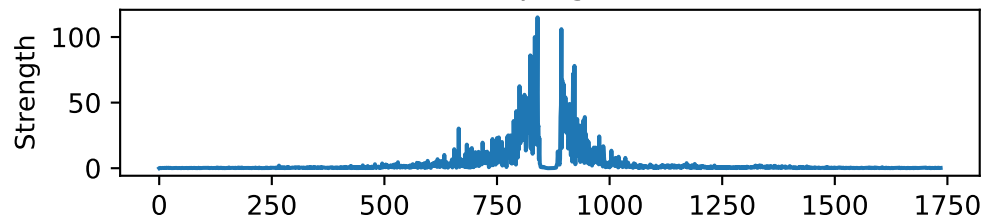


Geocoded sidescan image

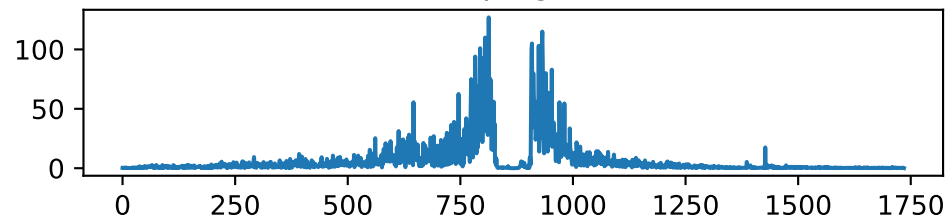


# Backscatters of two random pings in each processing step

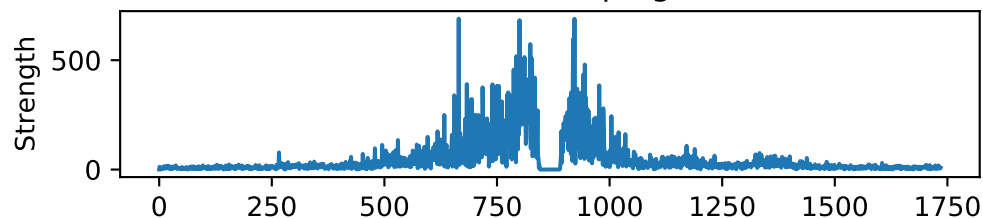
Raw ping 904



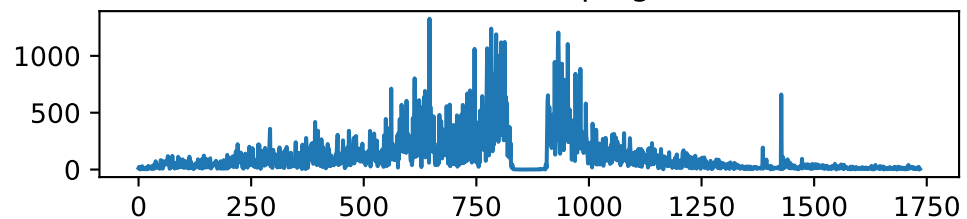
Raw ping 463



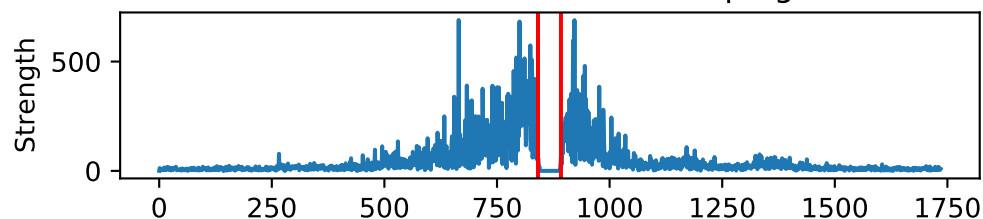
TVG enhanced ping 904



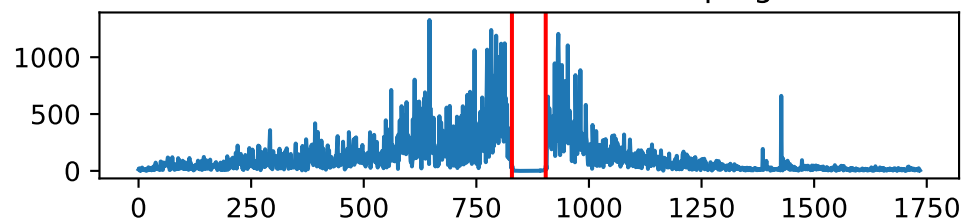
TVG enhanced ping 463



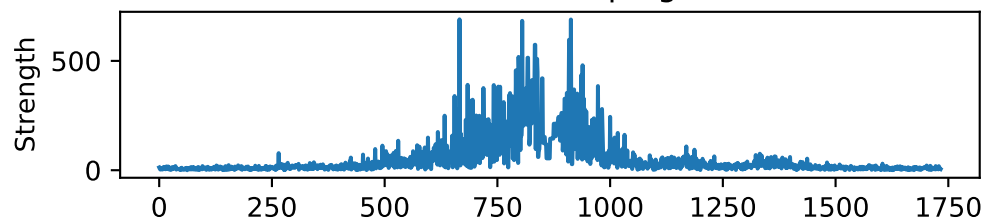
Bottom line on TVG enhanced ping 904



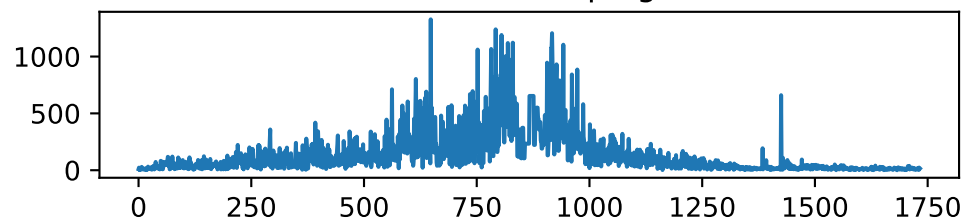
Bottom line on TVG enhanced ping 463



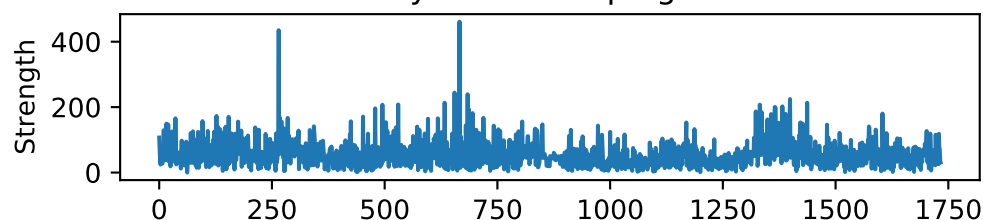
Slant corrected ping 904



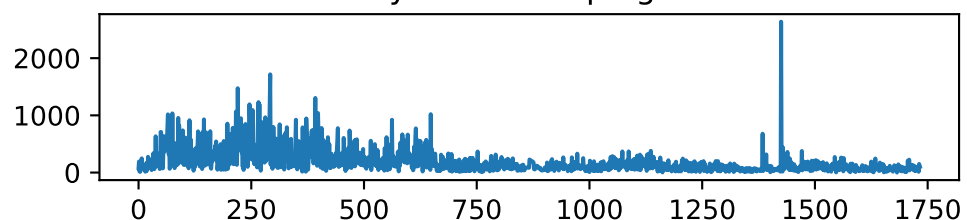
Slant corrected ping 463



Gray enhanced ping 904



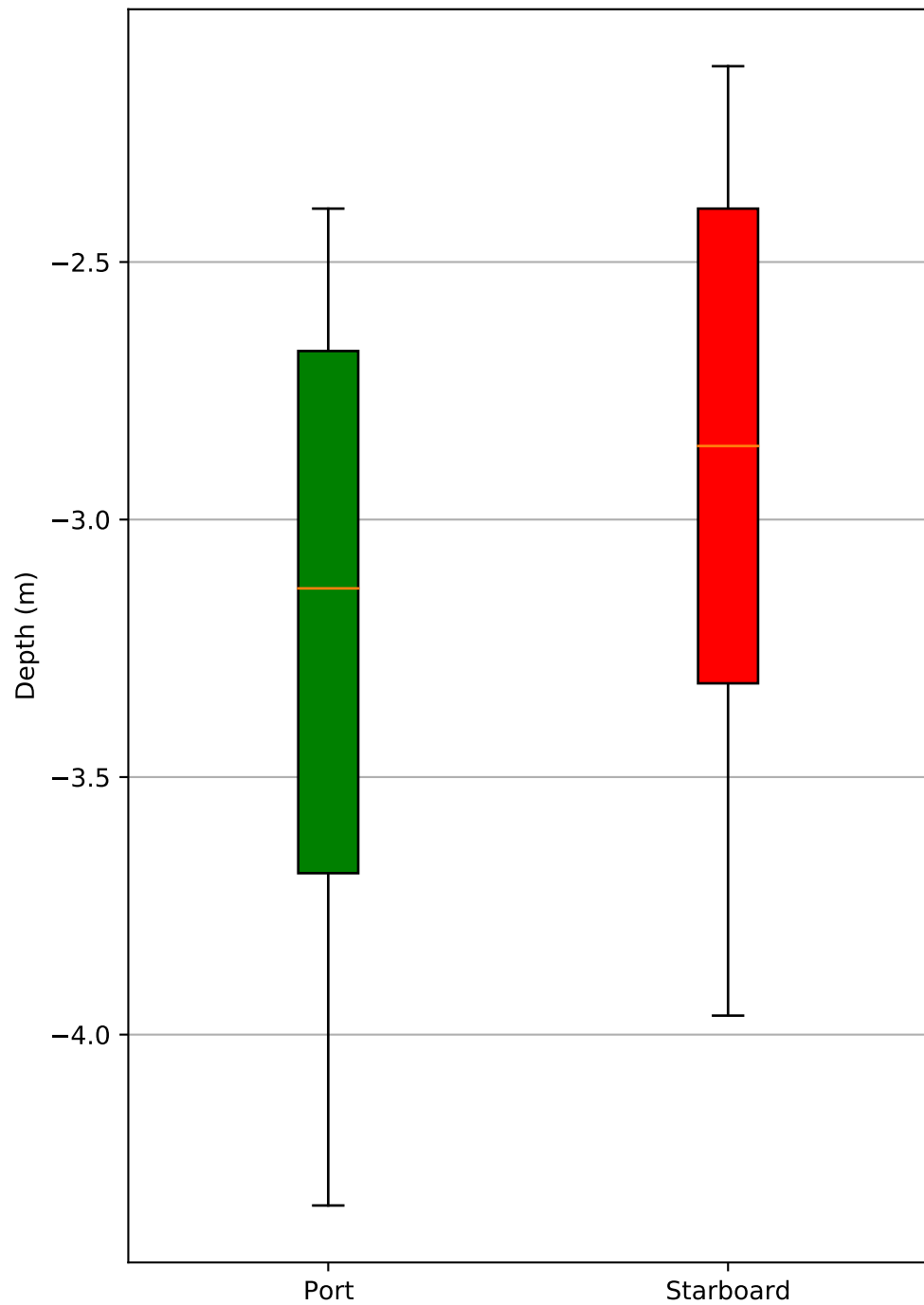
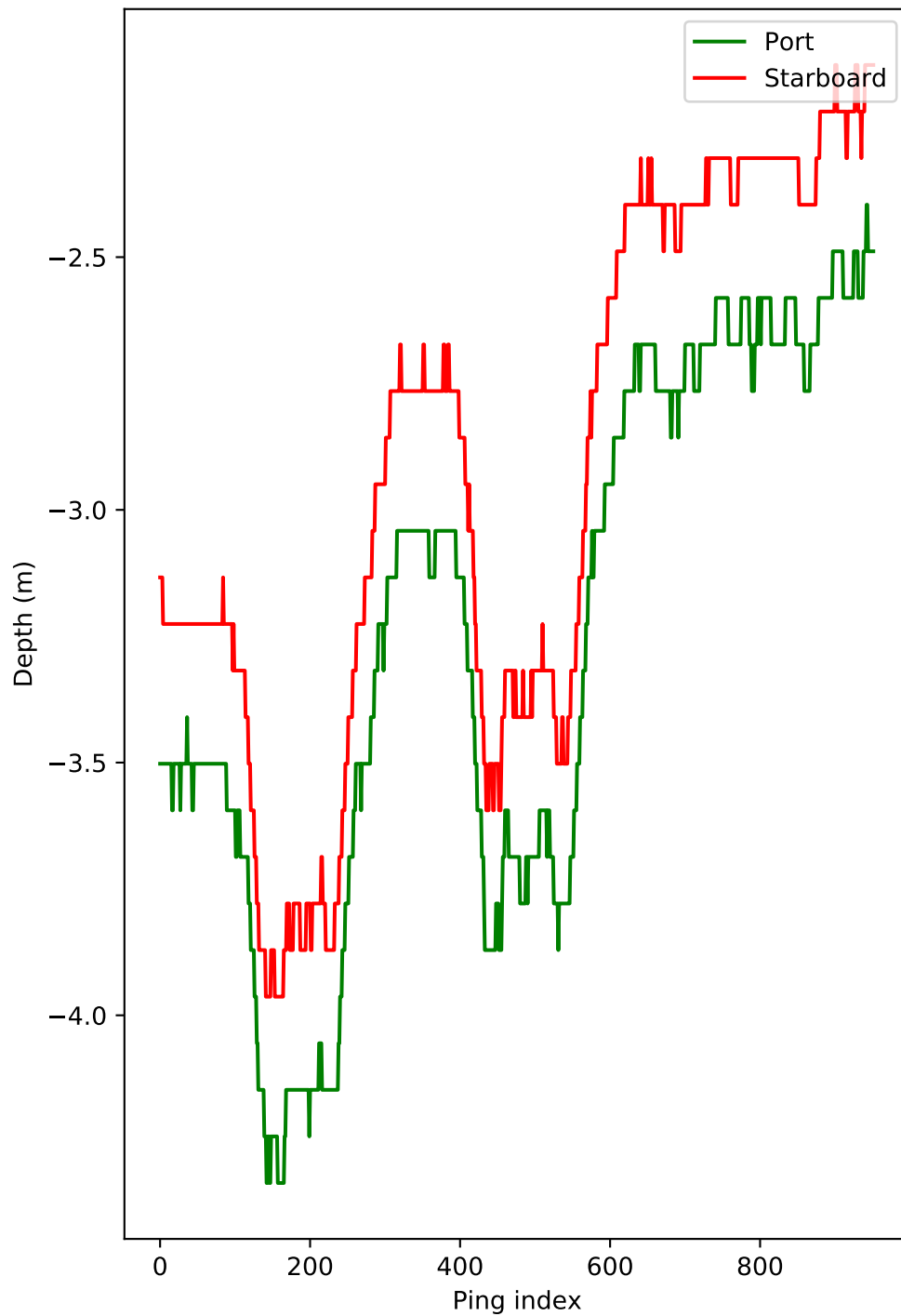
Gray enhanced ping 463



Backscatter samples

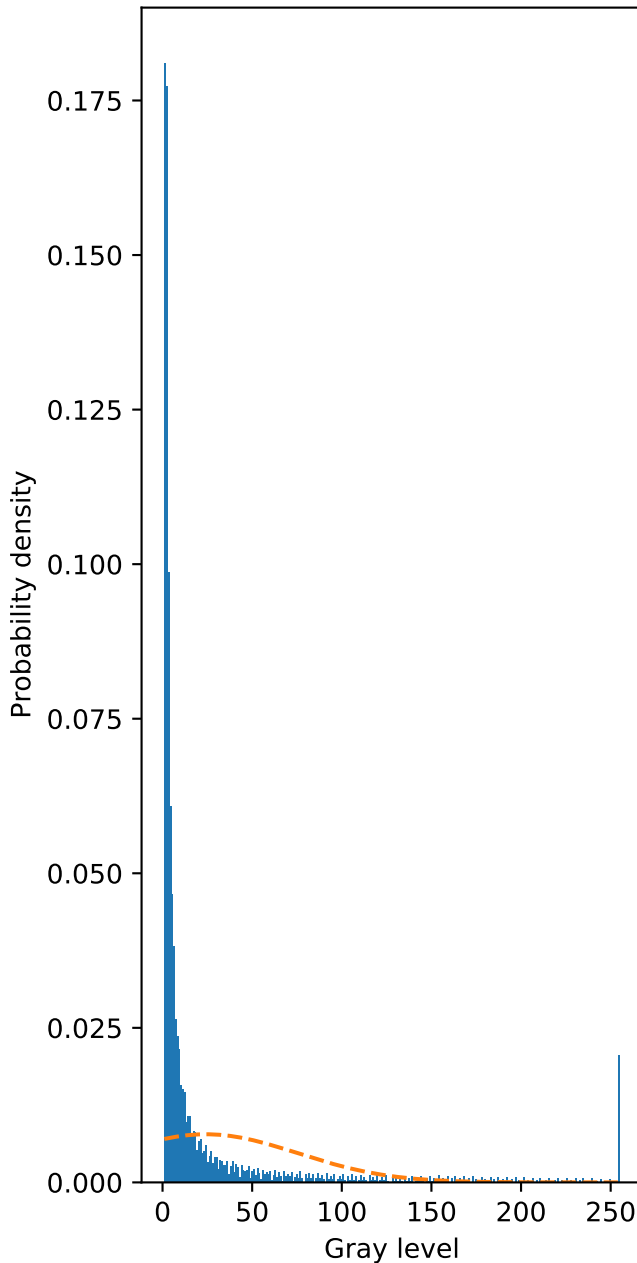
Backscatter samples

# Bottom depth distribution

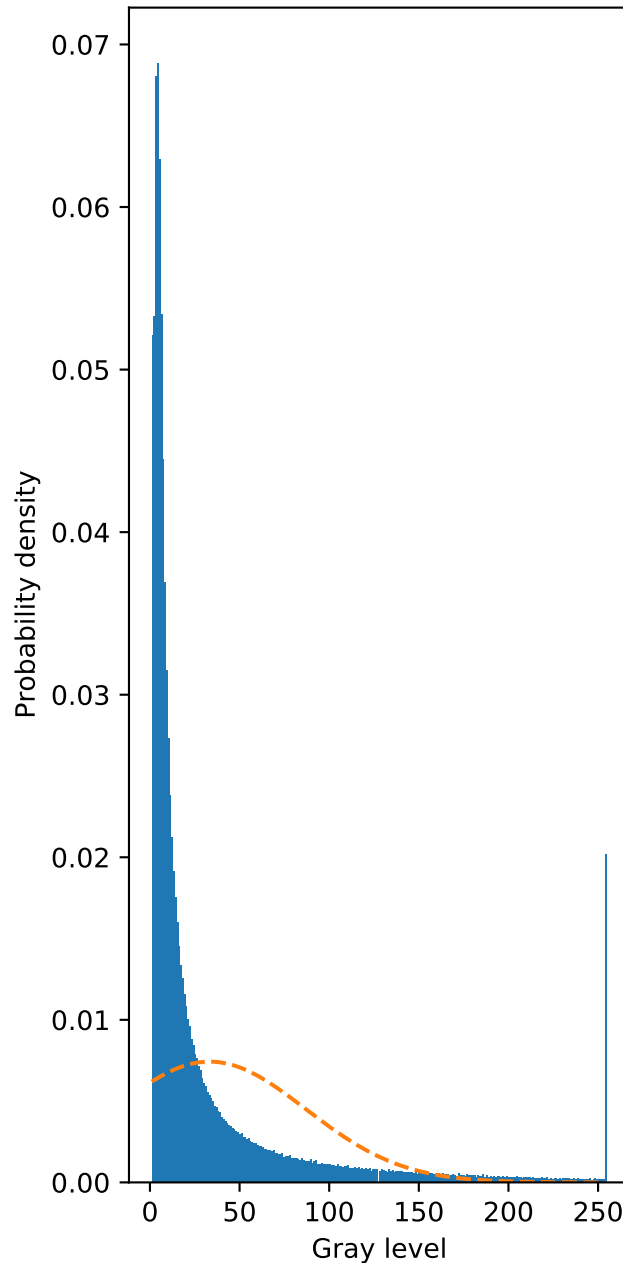


# Histogram before and after gray enhancement

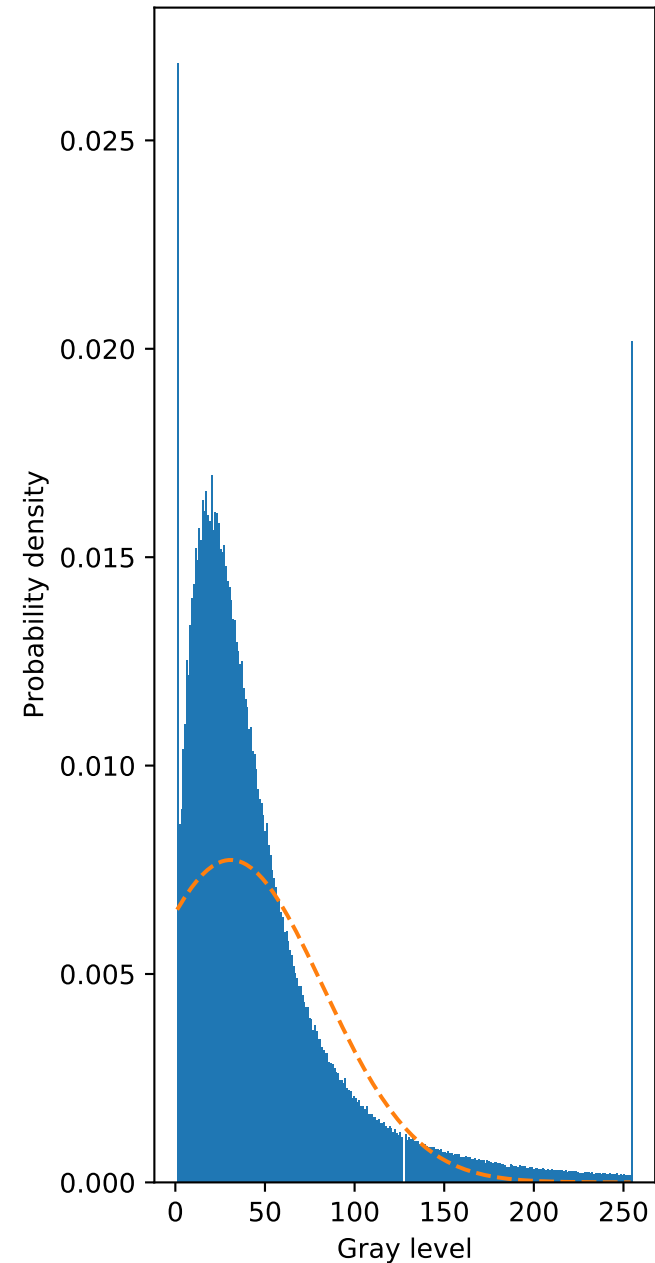
Raw waterfall:  
 $\mu=24$ ,  $\sigma=51$ ,  
difference=1.0525



TVG enhanced waterfall:  
 $\mu=33$ ,  $\sigma=54$ ,  
difference=0.8778



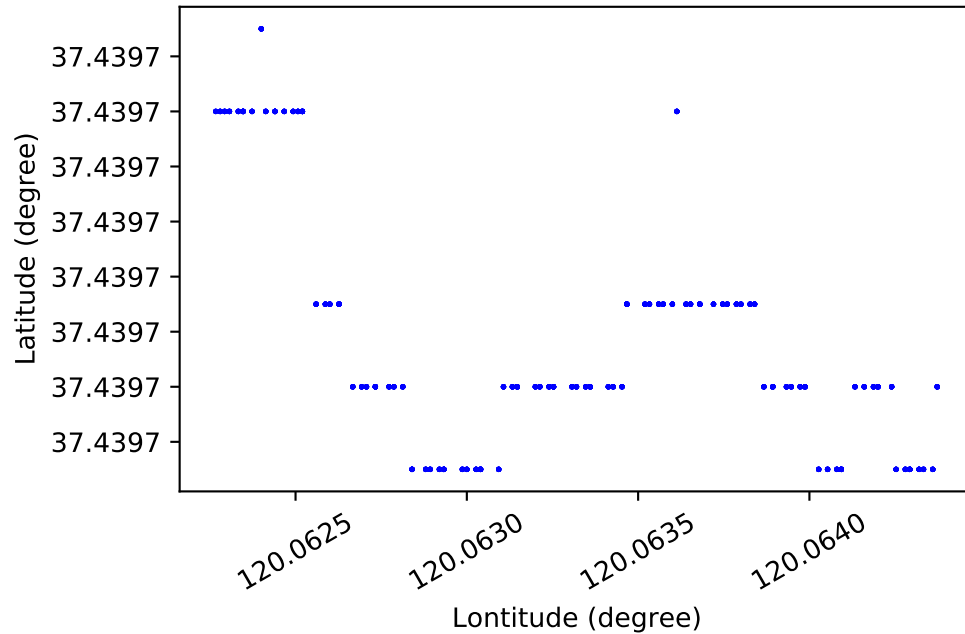
Gray enhanced waterfall:  
 $\mu=51$ ,  $\sigma=52$ ,  
difference=0.4236



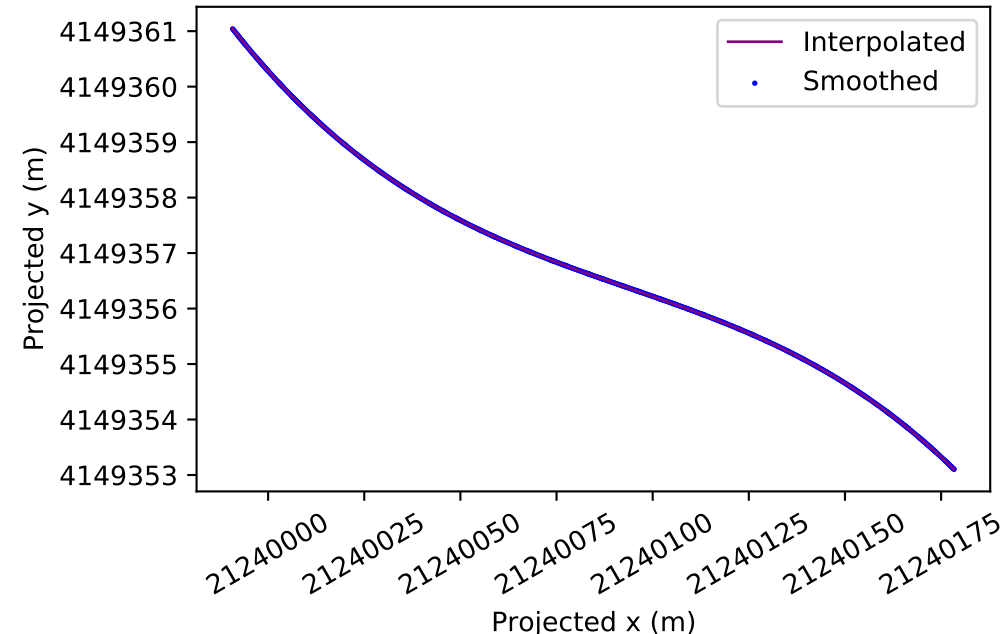
- Note: difference: absolute difference between histogram and normal distribution

# Survey line and ping direction

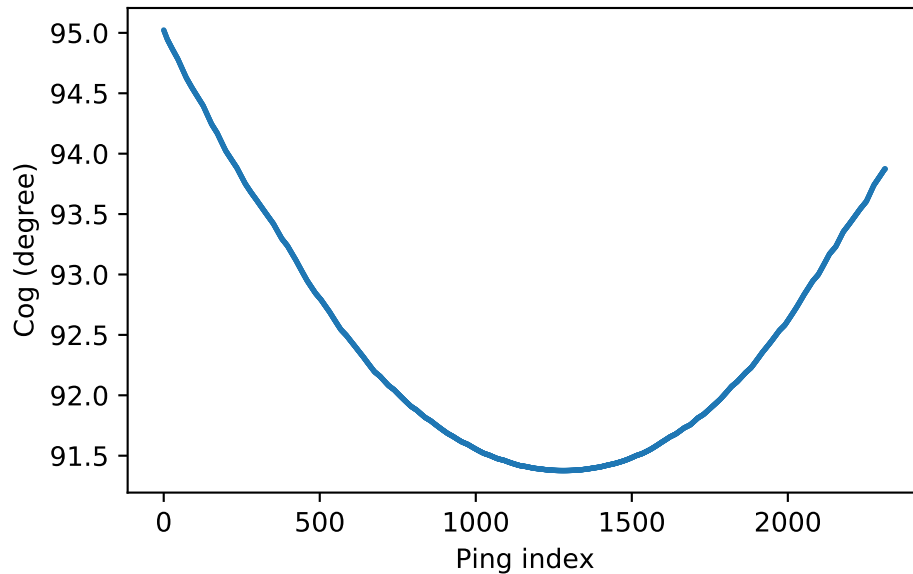
Raw survey line in geographic coordinates system



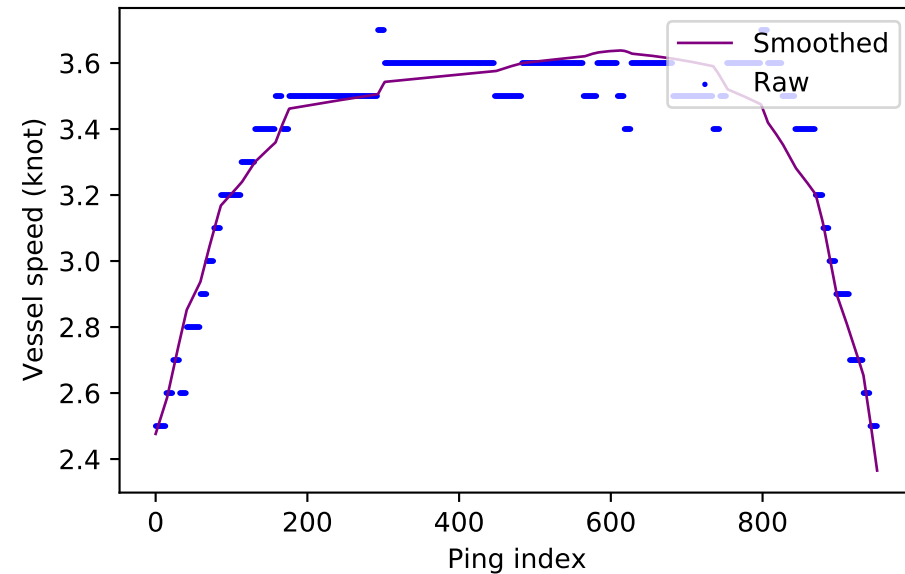
Survey line in projected coordinates system



Ping direction along survey line



Vessel speed along survey line



- The survey line is smoothed using a cubic spline curve with a smoothing factor of 80.0. The length of survey line is 187.8 m after smoothing.
- Cog (course over ground) is calculated from smoothed fish projected coordinates.
- Vessel speed is obtained from satellite navigation sensor and is smoothed using a cubic spline curve with a smoothing factor: 10.0.