

ADCP: automated shipboard processing and monitoring

Julia Hummon, Eric Firing

`hummon@hawaii.edu, efiring@hawaii.edu`

Goals

- Automated ADCP processing and plotting
- At-Sea access to data and plots
- Develop robust automated single-ping editing

This report is online at:

<http://currents.soest.hawaii.edu/reports>

Outline

- Components
- Products
 - Monitoring and Quality Control
 - Automatically processed data
 - Automatically generated plots
 - Web site on board ship
- Development

Much of the work done to date has been focused on the NB Palmer and LM Gould (NSF grant OCE9816483) and the University of Hawaii ship, Kilo Moana.

Components

- Linux computer with:
 - Extra serial ports
 - Software: python, UH Processing, Matlab
- ADCP
 - NB150, Broadband, Ocean Surveyor, Sontek
- DAS
 - DAS 2.48/2.49 (NB150)
 - VmDAS (BB,OS)
 - UHDAS (NB150, BB, OS, Sontek)
- Ancillary datasets
 - GPS Positions
 - Gyro heading
 - GPS-aided heading
 - (Other: soundspeed, pitch, roll,...)

Products: Monitoring

Monitoring and quality control

- Email messages, containing:
 - Status message
 - Linux system
 - Data acquisition
 - Health of instruments
 - Data subset
- Web site on land←
 - Status message
 - Palmer Data plot←
 - Gould Data plot←

Products: Data

- Automated processing
 - Frequency of updates is configurable
 - Ship-dependent calibrations incorporated
 - GPS-aided heading included
 - Edited
- Data access at sea
 - NFS mountable read-only disk
 - Windows read-only share
 - On-board web site
- data format
 - CODAS database
 - Ascii
 - Matlab

Products: Plots

- Figures automatically generated
- Frequency of updates configurable
- Plotting parameters configurable
- Previous figures are stored
- Example of figures:
 - Velocity
 - Contour plots of velocity (lon, lat, time)
 - Vector) plots (configurable depths and resolutions)
 - Vertical profiles) of recent data
 - Scattering
 - Color panel plot with AGC or RSSI

Products: On-board web site

The land-based Web site

- Figures←
- Data used to generate figures
- Access to database and data files
- Previously generated figures from cruise
- Documentation
 - Data acquisition system (Marine Tech instructions)
 - Processing methods
 - Instrument

Development

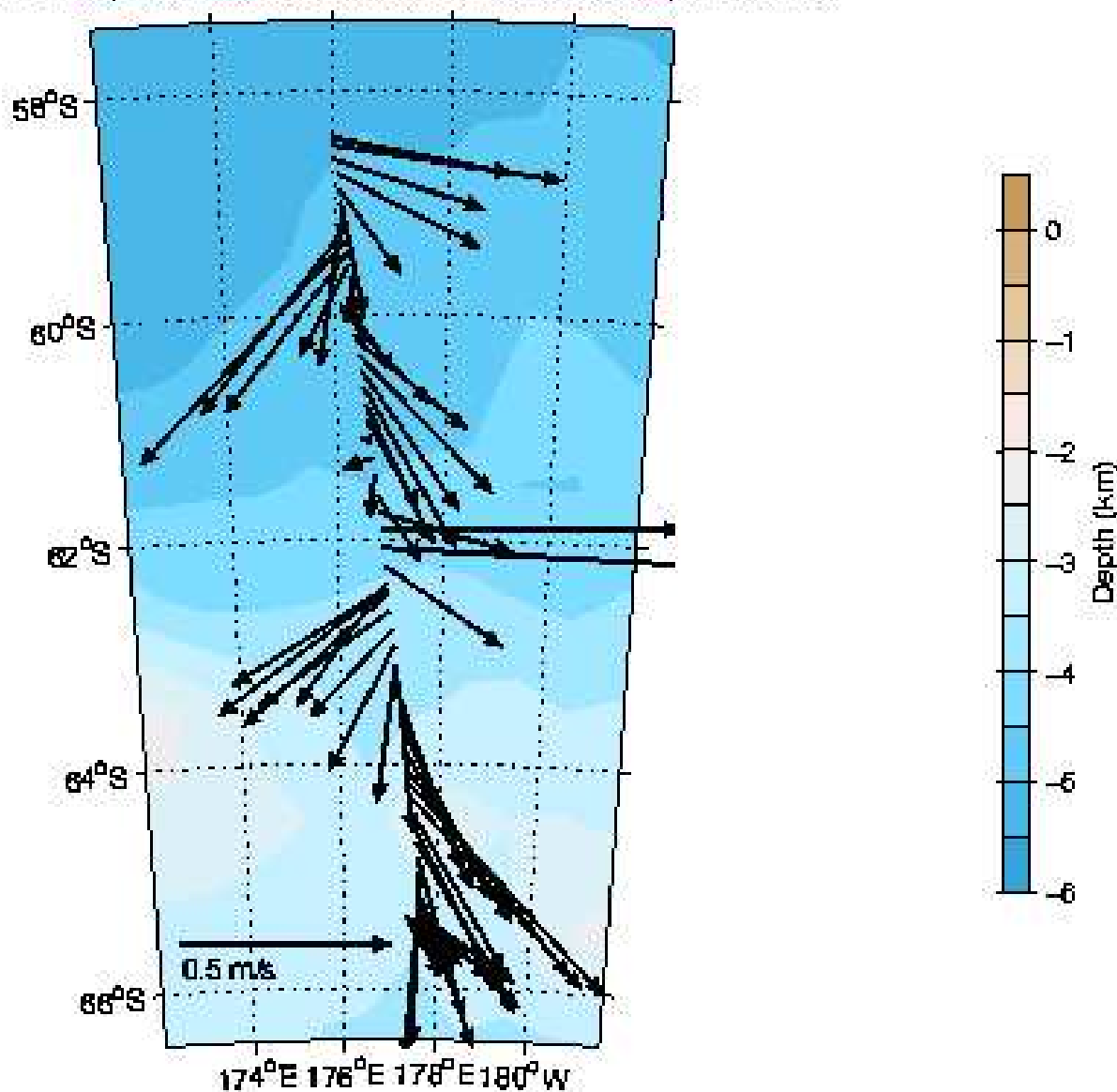
Modes of operation

- Starting with averaged data (any DAS)
 - Batch mode processing of averaged data
 - On-the-fly processing of averaged data
- Starting with single-ping data (any DAS)
 - Batch mode
 - Collect raw datasets
 - Merge raw components
 - Edit single-ping data (automated)
 - Average the raw data
 - ... then process averaged data
 - Complete data acquisition system (UHDAS)
 - On-the-fly: single-ping through fully processed

data subset: emailed, plotted on land

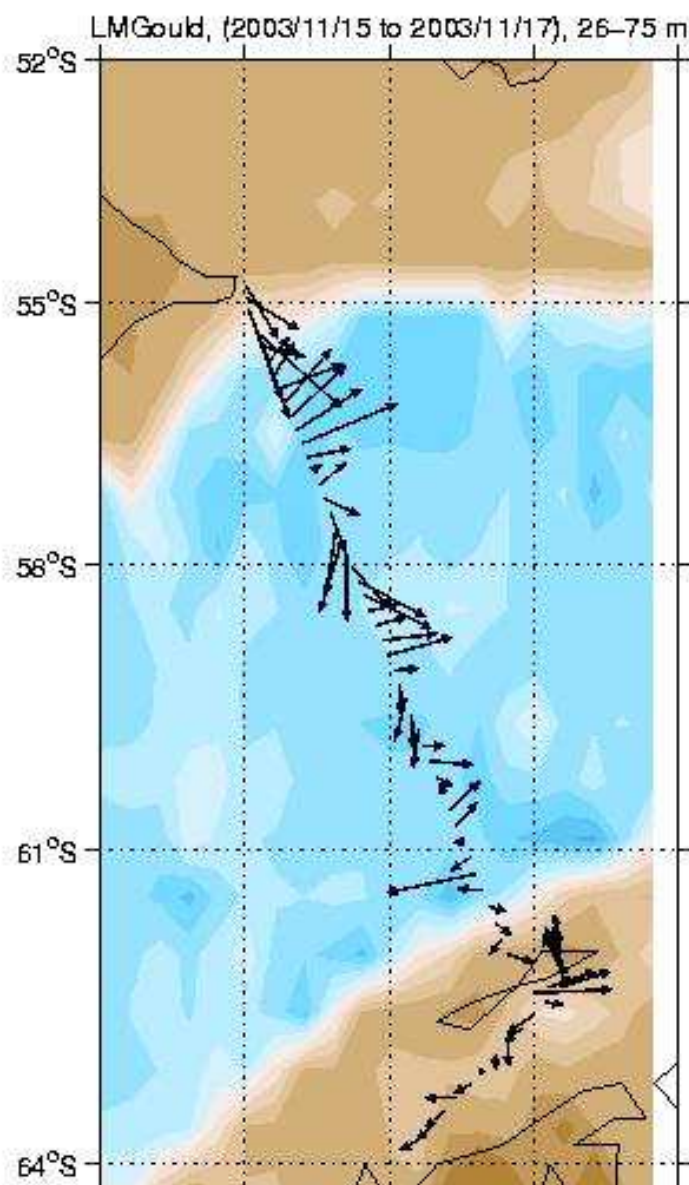


N B Palmer (2003/11/12 00:33:03–2003/11/15 00:09:03) z= 75–175

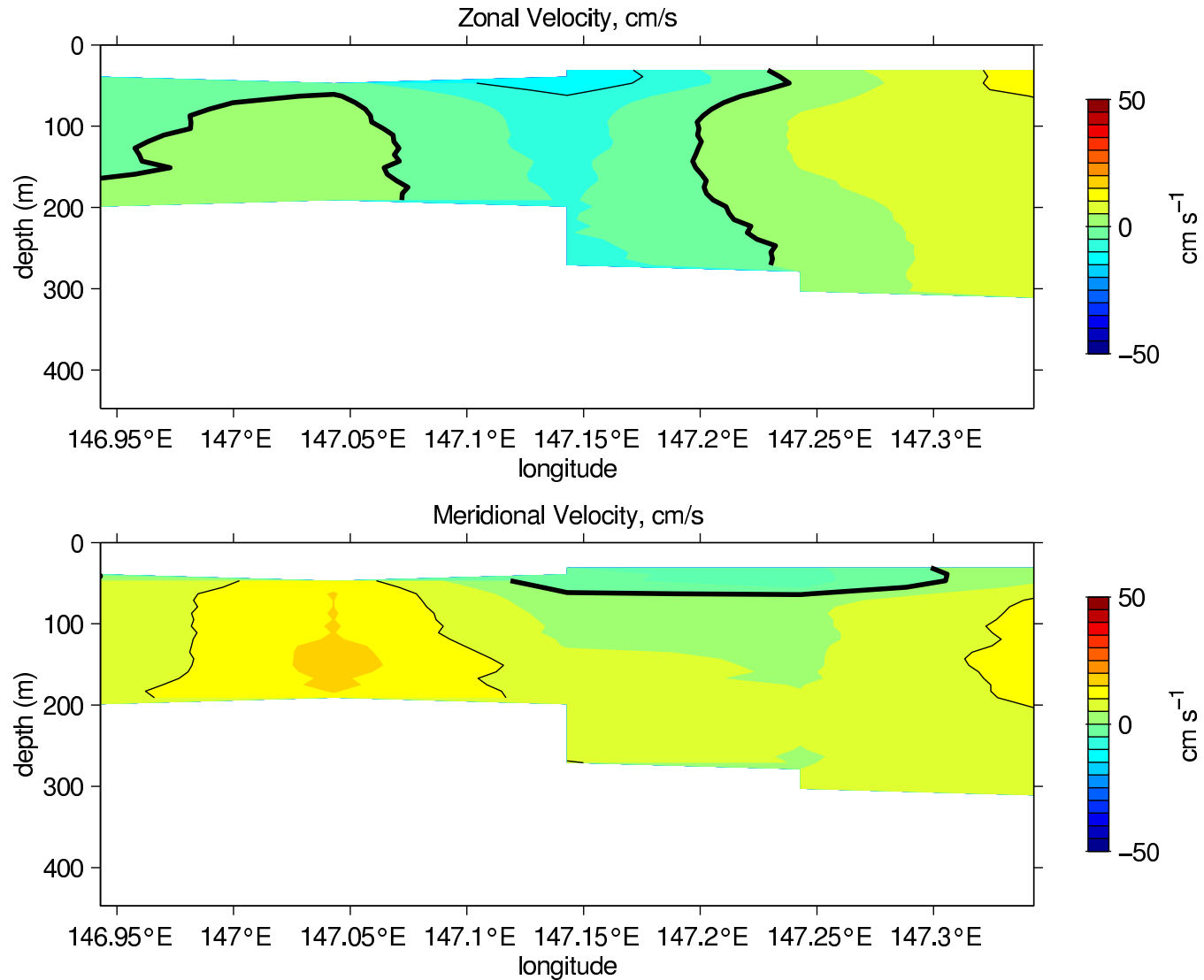


2003-11-14 19:40

data subset: emailed, plotted on land



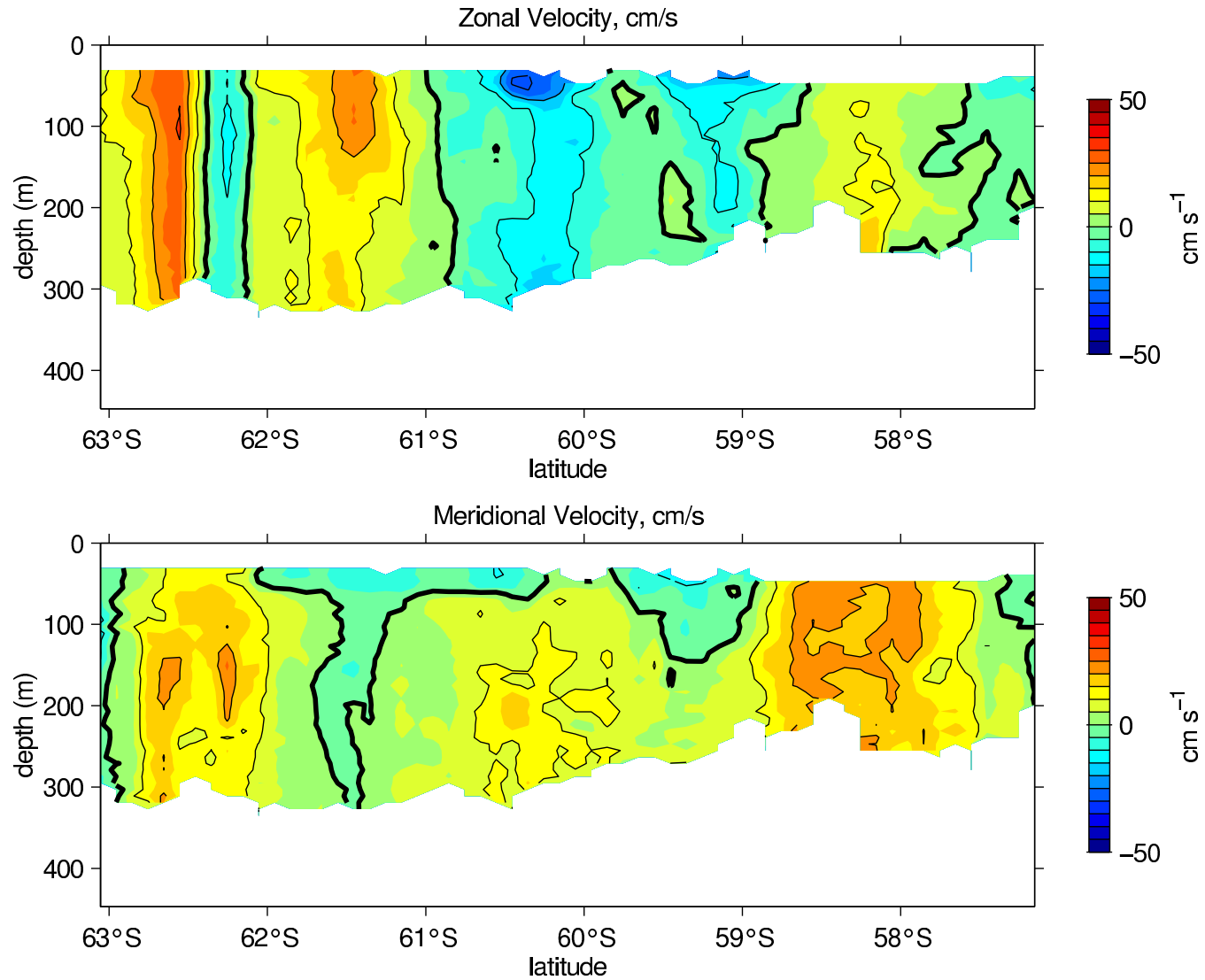
Plots: example



vg0109 (2001/02/02 11:56:40–2001/02/03 23:54:10)

2001-9-20 1:44

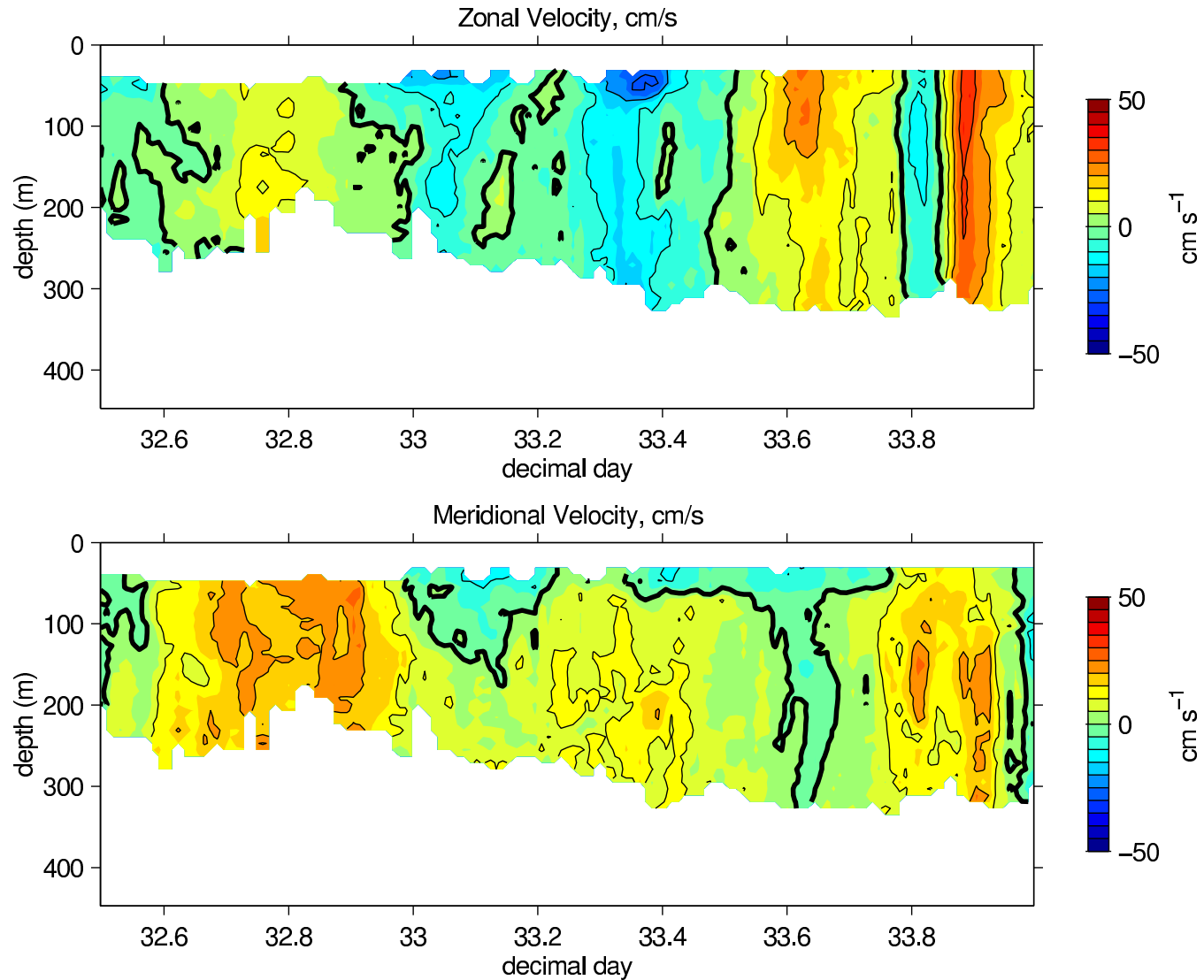
Plots: example



vg0109 (2001/02/02 11:56:40–2001/02/03 23:54:10)

2001-9-20 1:44

Plots: example

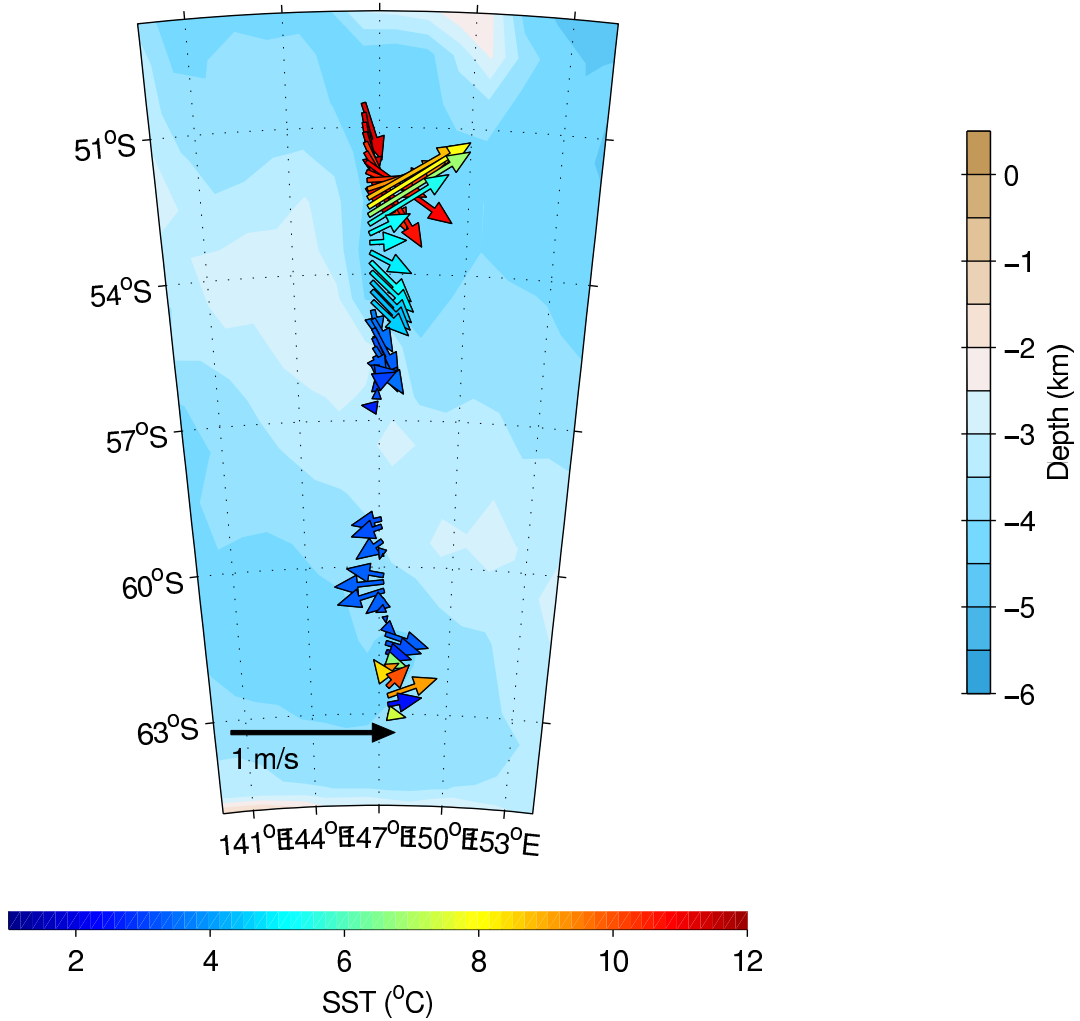


vg0109 (2001/02/02 11:56:40–2001/02/03 23:54:10)

2001-9-20 1:43

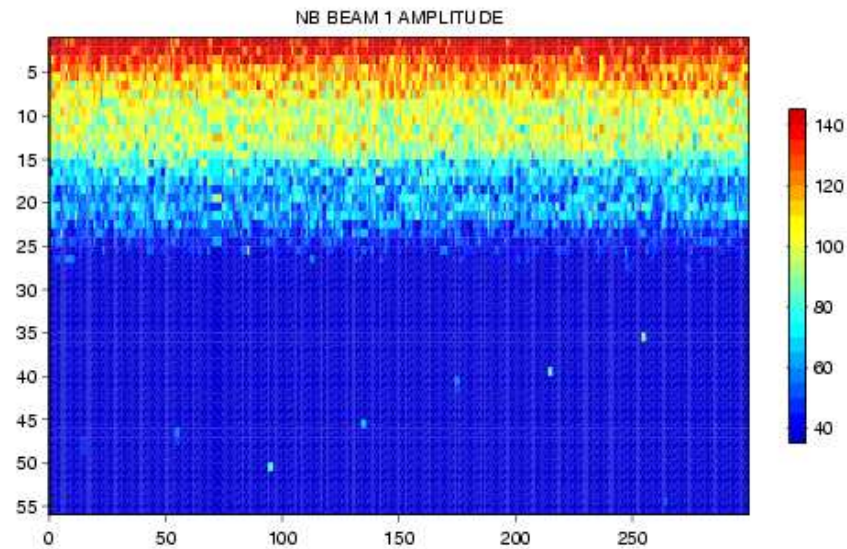
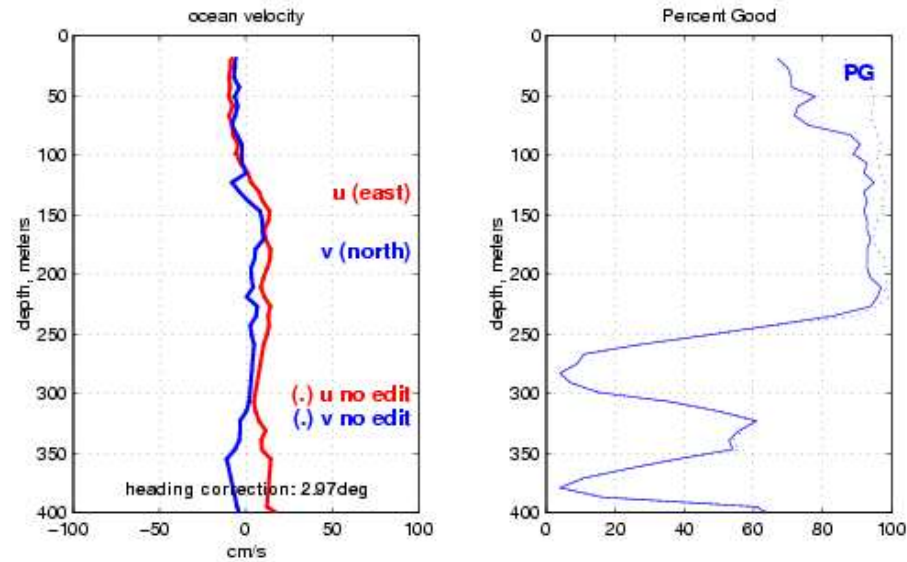
Plots: example

vg0109 (2001/02/01 00:34:10–2001/02/03 23:31:40) z= 31–50



2001-9-20 1:42

Plots: example



5 minutes of ADCP data, ending at 2003/08/10 12:50:23 UTC