

Summary of the Deep-Argo delayed-mode quality control (DMQC) Workshop 5-6 June 2023, virtual

This workshop was intended for delayed-mode operators of Deep Argo floats to share their experience regarding two important aspects of DMQC for Deep Argo salinity data:

- 1). the application of a CPcor adjustment for salinity from SBE CTDs; and
- 2). the evaluation of sensor drift to the expected Deep-Argo salinity accuracy of 0.004.

The workshop was held over 2 days, with the following agenda:

Day 1 - CPcor adjustment for Deep-Argo salinity from SBE CTDs in delayed-mode

- Summary of recommendations of CPcor adjustment in the Atlantic, by C. Cabanes.
- CPcor adjustment of JAMSTEC Deep floats, by K. Sato.
- Optimizing CPcor values for Deep floats in the SW Pacific basic, by Gilson & Zilberman.
- CPcor correction in the Mediterranean Sea, by A. Gallo.
- Open discussions, by all participants.

Day 2 – Delayed-mode sensor drift evaluation of Deep-Argo salinity to the expected accuracy of 0.004

- Summary of recommendations and examples in the Atlantic, by C. Cabanes.
- Sensor drift evaluation of deep floats in the Australian-Antarctic Basin, by A. Foppert.
- Deep_CTD_selection tool used to select deep reference data, by J. Lyman.
- Open discussions, by all participants.

The presentations and the ensuing discussions from the workshop indicated that for both aspects of DMQC for Deep Argo salinity data, new CPcor estimation and high-accuracy sensor drift evaluation, the Argo delayed-mode community was still at an experimental stage where various methods were being trialed, compared, and evaluated. As such, it was still too early for there to be recommendation of a single method. Therefore, instead of collecting the information in a static document, it was agreed that interactive discussions on Github, where issues can be tracked, were preferred.

One feedback to note from the workshop was that the availability of high-quality CTD data that were calibrated with bottle samples, taken at or close to deployment, would greatly improve the ability of delayed-mode processing to achieve the expected Deep Argo salinity accuracy of 0.004. For 2K floats, there were sufficient good quality 2K Argo profiles to make up the Argo_for_DMQC ref dbase to augment the main CTD_for_DMQC ref dbase. However, as of the time of this workshop, there were still too few good quality Deep Argo profiles to augment the reference database in areas with sparse reference CTD data.

The following were the resulting actions from the workshop.

1. DMQC operators to populate the spreadsheet with optimum CPcor values obtained for each deep float.

https://docs.google.com/spreadsheets/d/1ai1I0gzyHHRv_n6t2M3BMWVBp1F9XO4L2XB1YhBni9U/edit?usp=sharing

(All DMQC operators)

2. DMQC operators to share examples and discuss difficulties on

https://github.com/euroargodev/dmqc_deep_examples/

(All participants)

3. Consolidate the two sets of Matlab code, DM_CPcor and Deep_CTD_selection, under one Deep-Argo tools repository, on <http://github.com/ArgoDMQC/>

(Cecile & John Lyman – please take action)

4. Put on the workshop webpage and advertise

<https://www.euro-argo.eu/News-Meetings/Meetings/Others/Deep-Argo-DMQC-workshop>

- recordings of the Zoom sessions from the workshop
- Github links from Actions (2) and (3) above
- final version of this summary

(Cecile & Claire – please populate the webpage)

5. Identify old D-files from Deep-Argo floats that do not have CPcor adjustments. Notify responsible PIs and/or delayed-mode operators to revise and re-submit these D-files.

(Cecile – please check D-files from Deep-Argo floats and notify relevant PIs)

6. Comment on this draft, so that this workshop summary report can be finalized by the October ADMT meeting.

(All participants – please comment)

(Cecile & Annie – please finalize)

7. Make presentation in the October ADMT meeting

- this workshop summary report
- status of 'A' mode and 'D' mode adjustment of Deep-Argo data

(Cecile & Annie – please make presentation)

8. Organise another Deep-Argo DMQC Workshop in about 12 months.

(Any volunteers?)

Participants

Cecile Cabanes (chair & host)

Annie Wong (co-chair & moderator Day 1)

Virginie Thierry (moderator Day 2)

Nathalie Zilberman (co-chair)

John Gilson

Jan Even Oie Nilsen

Kanako Sato

Shigeki Hosoda

Esmee van Wijk

Annie Foppert

Kamila Walicka

Clare Bellingham

John Lyman

Greg Johnson

Brandon Navarro

Pelle Robbins

Kohen Bauer

Antonella Gallo

Christine Coatanoan

Yumi Song

Qi Wang

Pierre Rousselot

Meike Martins

Dave Murphy

Alberto Gonzalez