

Interactive comment on “Autonomous underwater vehicle based marine multi-component self-potential method: observation scheme and navigational correction” by Zhongmin Zhu et al.

Zhongmin Zhu et al.

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Dear Kai Chen,

Thank you very much for your comments and suggestions regarding this manuscript. The comments were very valuable and helpful for revising and improving our manuscript.

1. Comment 1: “Line 130, the detail of SP source did not given, such as current magnitude”. Response: Agree, the detail of source power is described in the text now: “The power supply provides a constant voltage about 36 V, the electric potential on the

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positive pole and the negative pole is 18 V and -18 V, respectively, when ignore the difference of copper plates. These electric potentials are also used in the subsequent numerical simulations.”

2. Comment 2: “Section 3.1 said that switching on and off manual power, changing navigation speed and steering will disturb SP measurement, but I can’t find the related descriptions in the result analysis about lake test”. Response: We only showed the results when the manual power is switch on indeed, in contrast, when the power is off, the collected signal is just consistent with the ambient noise, so we did not show the related results. About the contrast speed of the AUV, although we tried to change the speed of vehicle, we couldn’t extract the stable data with obvious difference in speed, we will supply relevant experiments in future researches. Some researches (Bloomer, S., Kowalczyk, M., Kowalczyk, P., Constable, S., Haber, E., & Kasuga, T. (2018). AUV-CSEM: An Improvement in the Efficiency of Multi-Sensor Mapping of Seafloor Massive Sulfide (SMS) Deposits with an AUV. oceans conference.) have showed the contrast of electric signal at different speed of AUV, we hope it helps. The steering of AUV, which could be expressed in Heading, will disturb the sampled electric field a lot (see figure 6 in the text), that why we should perform Azimuth or rotation corrections.

3. Comment 3: “Please demonstrating the accuracy of direction, pitch and roll measurement to the SP when corrected using a rotation transform in section 3.2”. Response: Ideally, we could recover the electric field completely, the error in the synthetic case is less than 1%, but in the field data, it’s hard to demonstrate the accuracy. 4 The Referee wrote: “Line 64 “four electric field receivers” should be revised to “four channel electric field receivers””. Response: We agree. Change done, thanks. 5 The Referee wrote: Line 67 “human interference” should be revised to “artificial interference”. Response: We agree, change done. 6 The Referee wrote: Line 77 “electric field receivers” should be revised to “electrode” or “electric field sensor”. Response: We agree, change done. 7 Line 100 “electrode spacing” should be revised to “Electrode dipole length”. Response: We agree, change done. 8 Line 103 “electrode distance.” should be revised

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to “Electrode dipole length”, Response: We agree, change done.

Once again, thank you very much for your comments and suggestions.

Sincerely, Zhaoyang Su

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