

Interactive comment on “Acoustic and optical methods to infer water transparency at the Time Series Station Spiekeroog, Wadden Sea (southern North Sea)” by Anne-Christin Schulz et al.

Anonymous Referee #2

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GENERAL COMMENTS: The paper presents a novel approach to comparison of different techniques for water transparency measurements using time series data. The purpose of this study was to find correlations between acoustic and optical measurements in order to fill possible gaps in water transparency data when individual instruments fail. This was successfully reached and important conclusions were made. Although, some parts of the text need clarification, I recommend this paper for publication in Ocean Science journal (Special Issue: COSYNA: integrating observations and modeling to understand coastal systems) after some minor revisions specified below.

SPECIFIC COMMENTS:

P2L25 explain 'SPM' at first mention

P3L18 explain NN

P3L19 It will be more clear if you give full reference of 2012, like in P2L10-11.

P3L28 How were these data checked for quality?

P3L29 How were they measured? Using the same instrument? Please precise.

P4L10-12 This sentence doesn't fit here, it should be moved elsewhere (it separates the information about extrapolation), e.g., in L4 before the information on Rmax. Also, there's no need to name plot colors in the text, they are visible on the graph.

P4L18 Try to make this description more clear. The sentence "The top right graphic shows the extrapolation results" is also true for the left graphic; try to highlight the difference between right and left graphics here, and afterwards explain. Is it the backscatter signal that is highly influenced by strong currents during ebb and flood? Be more precise. I guess, the currents may affect the ADCP backscatter signal as well as the presence of SPM. How do you separate this information? Describe or provide a reference.

P4L20-21 Can you provide a reference to support this assumption?

P4L22 Complete or whole? In the description of Fig. 5 you use 'whole' which seems better for the 'wwc' shortcut.

P4L24 I suggest to be more precise: 'acoustic backscatter', which 'other parameters' (they are only two, you can list them)?

P4L26 Support this assumption with a reference.

P4L27-28 This is a general statement appropriate for introduction. If you place it in 'Sampling and analysis' section, you should show how you applied this information in your study. Remove or reformulate.

P5L9 I would use 'scattering patterns' or 'scattering characteristics' instead of 'scatter

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behaviour'; the difference is actually in applied method, not in the behaviour of sediments.

P5L15 I guess, d stands for 'diameter'. It should be mentioned in the text. In this sentence you speak about sediment concentration and dynamics, but the value you give in brackets is neither one nor the other. Please correct.

P5L18 'these' refers to what? It's not clear which instruments you speak about.

P5L22-24 You didn't explain here the difference between one day and longer period correlation. Why do you think the results are significantly better for one day data? Is it only for this specific day, or a general trend? More detailed explanation is advised here.

P5L26-27 This sentence is general, it could be good for introduction, but not in a discussion section.

P5L24-25 I have the impression that you chose the constant extrapolation only because it gave better results in your study. Can you try to provide a stronger scientific motivation based on other published research?

P5L29 I suggest to say more precisely 'ADCP backscatter signals' or 'acoustic backscatter signals'. It should be clear you don't refer to optical backscattering here.

P5L31-33 - P6L1-2 This figure description is not consistent. The first sentence speaks only about the right graph. In the second sentence 'also' seems not appropriate. Please check and reformulate this description.

P6L2-3 This information is repeated from P5L30. It is difficult to understand the idea of such repetition.

P6L8 This conclusion seems to appear out of nowhere. It is not the result of your study. It seems to be your conclusion/assumption, but in the results and discussion section you don't speak about the possible artefacts of bio-fouling. I suggest to add a

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short description about the possible influence of bio-fouling on the quality of turbidity data. How long after or before cleaning maintenance was your 5-day study period? Do you assume that the one day study period was less influenced by bio-fouling? Did you receive similar conclusions in your earlier studies quoted in this paper, where you linked turbidity to Forel-Ule index?

P6L11 'is' seems to strong in this place; I would say 'can be' - looking at the correlation test results.

P6L12-13 This sentence should be in discussion section, and the results of Schultz et al. (2015) should be described briefly in comparison to your current results.

P6L13 Be careful with conclusions that go too far. Which responses do you call linear in your study? Spearman rank test doesn't prove linear correlation, but a monotonic correlation (which can be non-linear). Only some of your results show very strong or strong correlation; most of correlations is moderate or weak. I suggest simply to show your best and worse result with appropriate comments.

P6L18 Avoid citation in conclusions.

P6L20 powerful tool to do what? Be more precise.

Citations: 17 out of 41 references are authors' self-citations (which is more than 40%). I have the impression that some paper are quoted unnecessarily, giving three or four references to support one thesis is too much. If you see their findings are essential for your study, point them precisely in separate sentences.

All figures: the units in text are presented in a rectangular brackets. Please use the same way on figures and their descriptions.

Fig. 3. Description: add short information about the device and location

Fig. 4. The same. Can you add another LW profile plot? The graph makes a reader wonder why all examples are double except of LW. Height and depth - choose one way

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to describe this quantity.

Fig. 3-7,10-11. I suggest to add 'acoustic' or 'ADCP' backscatter in the figures' description.

Fig. 8. description: 'schematic' or 'scheme'?

Why the right graph of Fig. 9 contains much less points than the corresponding graph of Fig. 10? Both figures' descriptions show the same five-day period. Please explain and/or correct.

LANGUAGE COMMENTS: Although English is not my first language I see some minor grammar, punctuation and syntax errors. I recommend to use a professional English correction service, and in particular please check the following sentences/phrases:

P1L2-3 I suggest to continue the sentence in past tense: determined, demonstrated

P1L4 is=comes

P4L4 ...one of such...

P2L20 comma needed

P3L29 can be?

P4L8 "between ... and ..." or "from ... to ..."

P4L34 'earlier' or 'previous'

P5L20 compare

P6L13 sensor

P6L14 agree

P6L26 was=were

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