

Interactive comment on “Modeling of ships as a source of underwater noise” by Jukka-Pekka Jalkanen et al.

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The paper presents a methodology for modeling underwater noise emission from ships based on AIS data. The authors combine the Wittekind noise source model with an assessment model for ship traffic emissions. The quantification of the underwater noise emission from ships is a highly relevant topic today. The paper is well written and the methods are clearly outlined.

Regarding the source model, the authors have made a good effort to estimate the data required by the source model that is missing in the AIS data and ship databases. It would be interesting to see a comment (/motivation) on the choice of source model. I.e. to point out the advantages with this choice compared to older models in the

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literature. As both the authors and Dr. Wittekind points out in his comment, the model is mainly intended for large ocean going vessels with a single propeller. It would also be interesting to hear the authors view on this in relation to other recent studies trying to improve parametric models of ship source level for the purpose of mapping underwater noise emission from ships, e.g. [1, 2].

Regarding the simulation methodology, it would be interesting if the authors could put their work in relation to other similar attempts, e.g. [3, 4]. Especially since some of the co-authors, here are also co-authors of [4].

A specific comment about the discussion on noise emission from CP propellers, page 7, line 31: The reference (Li & Hallander, 2015), which is a popular text (without references) in SSPA customer magazine, is not the original source. I think the paper/report by Wittekind [6] is better as a general reference on this well known phenomena. How the noise first decreases and then increases again with decreased speed for a CP propeller is illustrated in [7]. A case study of the noise radiation from a ship with CP propeller at design speed compared to a typical reduced speed is presented in [5].

[1] C. Audoly, AQUO European Collaborative Project, deliverable R2.9 ” Ship Underwater Radiated Noise Patterns”, 2015. http://www.aquo.eu/downloads/AQUO_R2.9_Ship_URN_Patterns_V1.0.pdf

[2] C. Audoly, C. Rousset, “Parametric models of ship source level for use in an underwater noise footprint assessment tool”, Conference Oceanoise 2015, Vilanova i la Geltrú, Spain, 11-15 May 2015

[3] Thomas Folegot, Mapping anthropogenic noise in European waters: examples from the AQUO and BIAS European projects, Conference Oceanoise 2015, Vilanova i la Geltrú, Spain, 11-15 May 2015

[4] T. Gaggero, I. Karasalo, M. Östberg, T. Folegot, L. Six, M. van der Schaar, M. André, E. Rizzuto, “Validation of a simulation tool for ship traffic noise”, IEEE-MTS Oceans’15

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Conference, Genoa, Italy, 19-21 May 2015

[5] Hallander, J., Karlsson, R. and Johansson, T., 2015, "Assessment of underwater radiated noise, cavitation and fuel efficiency for a chemical tanker", OCEANS'15, Genoa, Italy.

[6] Wittekind, D., "Noise radiation of merchant ships", DW-ShipConsult, 10 July 2008.

[7] Beek, T. van. "Technology guidelines for efficient design and operation of ship propulsors", Propulsor technology, Wärtsila Propulsion Netherlands BV.

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