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Discussions

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

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The paper is well written and the procedures used and the result clear. I have the following comments The Wittekind model is valid for single screw ships only. Twin screw ships have in general lower propeller loading and a more homogenous wake field and therefore higher CIS. That is likely the reason that cruise liners and other twin screw ships appear quieter. Cruise vessels have CIS well above the mentioned 14 knots where diesel engine noise clearly prevails such that even if the propellers did cavitate they would be masked by diesel noise. The Wittekind model only considers 4-stroke engines be it for propulsion or as auxiliary diesels. 2-stroke engines are observed to have similar under water levels as resiliently mounted 4-stroke engines. 2-stroke engines may prevail at top speed but then they are masked by cavitation themselves.

If a heavy 2-stroke engine is taken as rigid mounted but with the same power-weight-noise relationship, diesel engine noise would be grossly overestimated. The model also does not cover CPP ships at low speed but these ships usually do not operate far away from their service speed in open water but in restricted areas they do. This may cause a very significant contribution in harbor approaches. I do not think that the above remarks if entered into the map would change very much but I recommend checking what the allegedly overestimated contribution of the 2-storke engines may do to it. Further remarks: âĂć It would be interesting to know what the source depth was assumed to be âĂć Maybe the Gigajoules could be converted into something more for feeling like the average equivalent URN level re 1 μPa in 100 m distance in 40 m water or something like this. It can be calculated by the educated but it would add to feeling what these numbers mean while reading âĂć Could the authors add a graph showing the output (source level) of the Wittekind model for 2 or three typical ships?

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