REVIEWER #1

In spite of abundant literature on acoustic cavitation which dates back to Flynn in 1964, the submitted paper is important as it approaches the hydrodynamic noise problem in an unknown way to naval architects even though it is not true at all that “hydrodynamic noise is an emerging field of investigation” as stated at the beginning of the Introduction. Some references from the naval architecture literature would be welcome.

We thank Reviewer 1 for the constructive comments; we corrected the sentence on the Introduction, since we agreed with the reviewer that “emerging field” was not a correct definition for the hydrodynamic field. We also added some references relative to recent papers on ship hydrodynamics.
In the following a one-by-one reply to the Reviewer's remarks.

Only one question:
Have experimental observations been obtained at low frequency cavitation, say, below 100 kHz, or high-frequency cavitation which is less documented worldwide?

The phenomenon of cavitation was not considered in the present work, the simulation concerns a single-phase incompressible flow. The helical stuctures highlighet in Fig 3 are visualization of vorticity field in the single-phase fluid. However, investigating on the physics of cavitation and its modeling are one of the next goals of our work.

and one observation
At paragraph 3.2 the errors of 3.18% and 1.89% for thrust and torque coefficients, respectively, between experimental data and numerical results are not marginal from an engineering viewpoint. Please, comment!

We agree with the Reviewer. The errors are not marginal but in any case small and aligned with other numerical simulation relying on wall-functions for similar case. Moreover, as mentioned in the paper, we are testing a mesh without any prismatic layer, and the mesh at the blades is not optimal in this sense. Also, since the paper contains preliminary results, the simulation time was not long enough to obtain convergent statistics. However we stress out that these results are encouraging still being preliminary.
The main focus in this study is on the hydroacustic analysis, and in particular on the role of the non-linear terms of FWH equation. For such reason we focused more on the wake region, considering an adequate mesh refinement and the associated computational effort. We can assume that such a fluid dynamic field is acceptable for carrying out the acoustic analysis. A discussion is added in the revised manuscript.

Finally, two minor remarks regarding symbols which are to be set according to International Towing Tank Conference rules:
a) In equation (5) substitute Ua with Va , to be defined as advance coefficient
b) In equation (6) denote thrust as T, not as S.

The notations suggested by the Reviewer were considered.

REVIEWER #2

The paper is interesting and well written, although some misprints and slight inaccuracies provided here below in the mathematical background of the acoustic approach have to be fixed. Figures should be larger to make the results clearer. Furthermore, the noise spectrum at point(s) out of the propeller disk (mentioned in the text, but not included in the paper) should be added. This result highlights the significant role played by nonlinear sources and somehow justifies the use of a LES simulation.

We thank Reviewer 2 for the good consideration of the work. We considered the suggestion about the Figures that were slightly enlarged. However, due to limitations in space, the results concerning the microphone outside the propeller disk were not added as Figures. However we plan to dedicate a separate study regarding this aspect.

A one-by-one reply to the Reviewer's comments follows:

- Ffowcs-Williams should be without "-", everywhere in the manuscript

- corrected

- Hawking should be Hawkings

- corrected

- The last sentence in the Introduction is not really appropriate. In the last years many papers were published on the matter, often focused on the use of the FWH porous formulation with RANS/DES/LES data, thus accounting for the full (nonlinear) solution

- we corrected the last sentence in the Introduction, also including a reference concerning the use of porous formulation

- Section 2: NavierStokes should be Navier-Stokes

- corrected

- In the paragraph below equation (2) the Levi Civita III-order tensor is written with commas, but in the equation (1) it is without. Please fix it

- corrected

- Equation (3): The authors state they use the "advective" form of the FWH equation, but (3) seems the traditional form of the porous formulation (with no inflow velocity, which, in fact, does not appear anywhere).

- corrected

- Three rows above equation (4): Mr is NOT the rotational Mach number. It is the projection of the Mach vector along the source-observer direction.

- corrected

- Two rows above equation (4): being x the observer position at the observer time t and y the source position at the corresponding emission time \tau

- the sentence was added

- Last row section 2: "rotation" should be "motion" to be more general

-corrected

- Third paragraph section 3.3: The result "out" from the propeller disk is significant and should be shown. It points out the relevant decrease of the FWH linear terms and the important role played by nonlinear sources, which somehow "justifies" the use of the LES simulation.

- We agree. However, in the present manuscript we report our interest in coupling LES simulation with FW-H porous formulation to investigate on propeller noise. As mentioned before, we found out that a deeper analysis on FWH non-linear terms contribution deserves a dedicated space. A journal paper with more results and a more detailed analysis is undergoing.

- Last paragraph above Conclusions: "no overlapping of pressure signals" should probably be "no significant time shift between pressure signals from different source points"

-we considered the reviewer sentence

- Two rows above Conclusions: "become" should be "becomes""

-corrected