

CODECHECK certificate 2024-25 for Determination of a diffusion coefficient function for long rooms using a least square optimization approach



Item	Value
Title	Determination of a diffusion coefficient function for long rooms using a least square optimization approach
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Ref. paper	https://pure.tue.nl/ws/portalfiles/portal/339520759/IN_2024_3491.pdf
Codecheckers	João Fatela [0009-0009-4474-171X] Simon Kersten [0000-0003-3303-9297]
Date of Check	2024-11-08
Summary	Full reproduction
Repository	https://github.com/IlariaFichera/Inter_Noise_2024_Codes_Acoustics_Diffusion_Equation?tab=readme-ov-file
Ref. certificate	10.5281/zenodo.15023714

Table 1: CODECHECK summary

Output	Comment
Matlab figure plots	Paper features rendered figures output by the code in the repository. The plots pertain to simulation output files generated by intermediate scripts.

Table 2: Summary of output files generated

Summary

A step-by-step execution of the guidelines present in the repository (README.md) led to accurate reproduction of the plots shown in the associated paper publication.

CODECHECKER notes

Installation prerequisites and computational environment

Simple requirements and easy installation. Python requirements installed in local conda virtual environment. MATLAB requirements were installed locally and added to the MATLAB setup paths permanently.

Data preparation

All necessary input data is provided in a folder inside the repository. No issues arise, provided the instructions in the README file are followed.

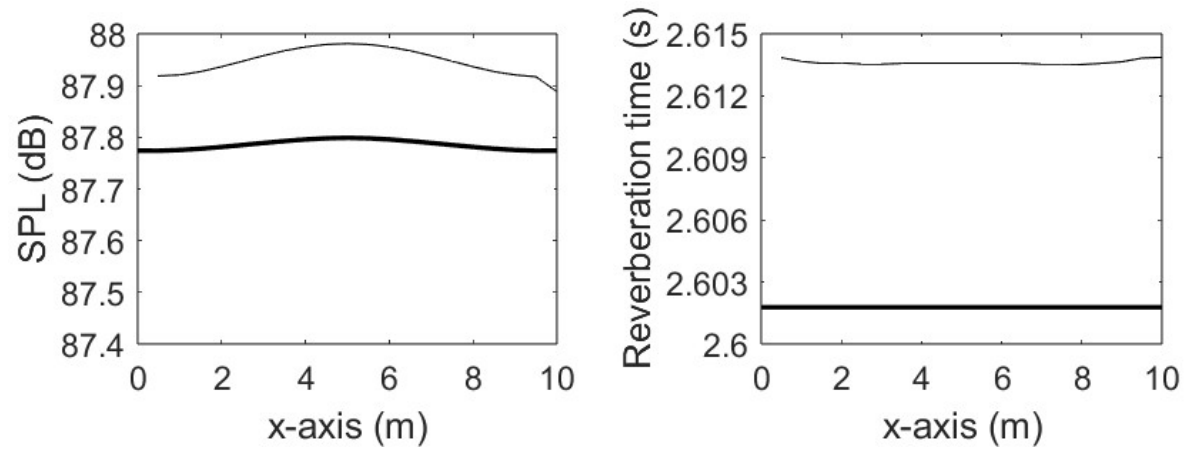
Running the code

For the reproduction of the output relating to the 10x10x10 room, some variables were changed for the sake of a timely reproduction. Specifically, the spatial (dx) and time steps (dt) of the finite-difference scheme were increased to $dx=0.5$ and $dt=1/20000$ in *1-DiffEq3D.py*. This did not lead to noticeable differences in the output.

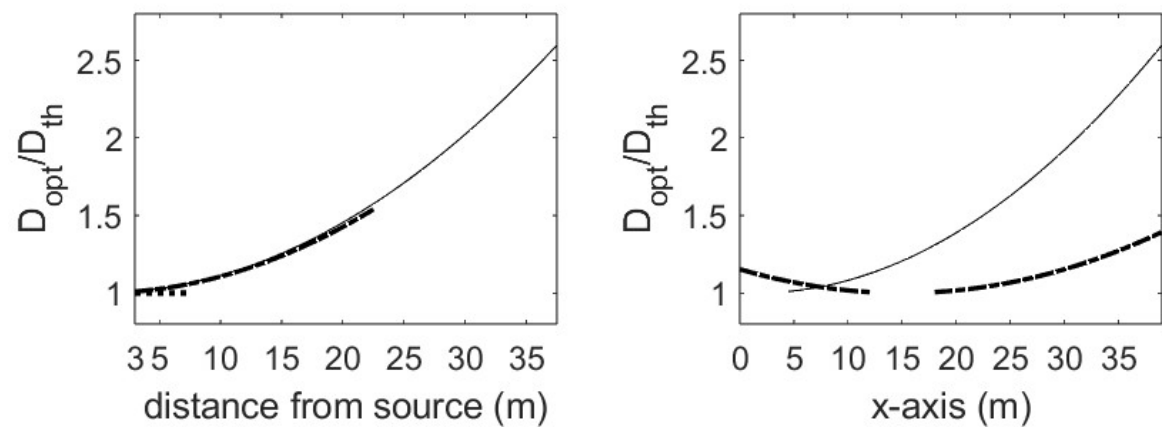
Outputs

The outputs consist of MATLAB figure plots. These are generated from intermediate files, assembled from the main simulation files. The MATLAB figures are not automatically saved in a local directory. The content of the figures matches the content of the figures featured in the paper regardless.

Below are some examples of figures created by the authors of the report, labeled after the corresponding figures in the publication.



Figures 1(a) (left) and 1(b) (right)



Figures 6 (left) and 8 (right)