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A note on the explicit solutions for wave scattering by vertical porous barriers

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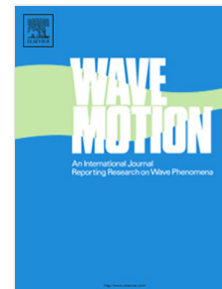
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Research highlights

- Complete analytical solutions are obtained for normally incident deep water wave scattering by vertical porous barriers of different configurations.
- Two novel integral relations are introduced to establish a connection between porous wave potentials and solid wave potentials through auxiliary wave potentials. The porous and solid wave potentials solve the scattering problems involving porous and solid vertical barriers of same configuration respectively while the auxiliary wave potentials solve the problems of bi-directional wave generation by the solid barrier.
- Each integral relation decomposes the original problem into two boundary value problems that can be solved in closed form. The integral relations are then solved to find the required porous wave potentials explicitly in terms of the decomposed wave potentials.
- The present approach is utilized to the partially solved normally incident wave scattering problem of Manam and Sivanesan [1] that involves partial vertical porous barriers. The scattering problem is completely solved and obtained the porous wave potentials in an alternative form.
- The reflection coefficients involved in the problems are also connected. The reflection amplitudes of the normally incident wave against different vertical porous barriers are obtained explicitly. Numerical results for the scattering quantities are presented.

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