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Computational performance of analytical methods for the acoustic modelling of automotive exhaust devices incorporating monoliths

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HIGHLIGHTS

Analytical modelling techniques are proposed to speed up transmission loss calculations in exhaust devices incorporating monoliths.

Multidimensional sound propagation in the expansion and contraction regions is combined with one-dimensional waves in the monolith capillary ducts.

The performance of the point collocation technique and the mode matching method is compared in terms of computational effort and accuracy.