

Abstract Submitted
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Low Mach number prediction of the acoustic signature of fractal-generated turbulence SYLVAIN LAIZET, Imperial College London, VÉRONIQUE FORTUNÉ, ERIC LAMBALLAIS, Institut P', CHRISTOS VASILICOS, Imperial College London — We compare the acoustic properties of a fractal square grid with those of a regular grid by means of a hybrid approach based on Lighthill's analogy and Direct Numerical Simulation (DNS). Our results show that the sound levels corresponding to our fractal square grid of three fractal iterations are significantly reduced by comparison to a regular grid of same porosity and mesh-based Reynolds number. We also find a well-defined peak at a Strouhal number between 0.2 and 0.3 in the acoustic spectrum of our fractal square grid which is absent in the case of our regular grid. We explain this effect in terms of a new criterion for quasi-periodic vortex shedding from a regular or fractal grid.

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