

## Aerodynamic Sound from a Sawtooth Plate with Different Thickness

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**Abstract :** The effect of sawtooth plate thickness on the aerodynamic noise generated in flow at a Reynolds number of 150 is numerically investigated. Two types of plate thickness ( $h_{\text{thick}}=0.2D$  and  $h_{\text{thin}}=0.02D$ ) are proposed. Flow simulations are carried out using Direct Numerical Simulation, whereas the calculation of aerodynamic noise radiated from the flow is solved using Curle's equation. It is found that the flow behavior of thin sawtooth plate, consisting counter-rotating-vortices, is more complex than that of the thick plate. This then explains well the generated sound in both plates cases. Sound generated from thin plat is approximately 0.5 dB lower than the thick plate. Findings from current study provide better understanding of the flow and noise behavior in edge serrations via understanding the case of a sawtooth plate.

**Keywords :** aerodynamic sound, bluff body, sawtooth plate, Curle analogy

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