

Abstract Submitted  
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**Investigation of a tone in flap tip noise** RAFAEL S. GIORIA, STERGIOS P. TSILOUFAS, NDF, Dept. Mech. Eng., Escola Politecnica, University of Sao Paulo, FRANCISCO K. KLUG, Embraer, JULIO R. MENEHINI, NDF, Dept. Mech. Eng., Escola Politecnica, University of Sao Paulo — In this paper, we investigate numerically the noise generated by the flow around a high-lift configuration. The case studied is the noise generated by the flap tip of the MDA-30P30N high-lift geometry. We propose a cavity model as a simplification for the flap cove flow near the flap tip. The idea of representing the flap cove as a cavity is due to a tone in the spectrum from the numerical simulations of the full high lift geometry MDA-30P30N without spanwise gap between extended flap and the stowed flap. A high peak around 900Hz to 1000Hz was not expected and its source is not clear. The effort here is to investigate the source of frequencies around this value. There is a possibility of noise tones generated from the flap cove with frequencies around 900Hz according to the Rossiter model for the cavity. This mechanism of noise generation seems to be associated to the peak in the spectrum. Snapshot of instantaneous vorticity field near the flap tip supports that a mechanism of noise generation resembles the cavity mechanism. Further corroboration is presented through the Koopman modes (dynamic mode decomposition) of the pressure fields.

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