1077-76-2481 **Hyunsun Lee*** (`hlee9@fsu.edu`), **Ali Uzun** and **M. Yousuff Hussaini**. *Identifying jet noise source based on high-fidelity numerical simulations of round and chevron jet flows.*

An acoustic analogy using decomposition of the Lighthill source term to ten sub-terms is discussed based on two simulations of round jet and Chevron jet configurations, at Mach number 0.9 and Reynolds number 1×10^5. These sub-terms consist of density, velocity, vorticity and dilatation fields, presenting their mutual non-linear interactions.To understand aerodynamic noise generation mechanism, intrinsic links between turbulence and emitted sound waves, such as cross-correlation function, are necessary. This causality method is directly adopted to the LES data to identify fundamental noise sources by calculating the cross-correlation between each spatial sub-term in near field and acoustic pressure fluctuation at a far field position, showing its contribution on the noise generation. Three principal noise production terms, related to Laplacian of turbulence kinetic energy and divergence of Lamb vector, are witnessed and interpreted, showing encouraging agreement with previous predictions. The comparison of profiles between round and Chevron jet configurations potentially shed light on accessing better understanding on the mechanism of control devices. (Received September 22, 2011)