

Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Dynamic Mode Decomposition of a Supersonic Jet Exhausting a Convergent-Divergent Nozzle BERNHARD SEMLITSCH, MIHAI MIHAESCU, LASZLO FUCHS, KTH Mechanics, KTH MECHANICS TEAM¹ — Non-ideal expanded supersonic jets provoke further noise sources additional to the turbulent mixing noise source, which is present in subsonic jets. In particular, the screech tones are a undesired shock associated noise source in the supersonic jet exhaust, since high amplitude acoustic waves are radiated upstream, where the pressure fluctuations could cause damage to the airplane structure. Satisfying suppression of acoustic noise in a supersonic jets requires further investigation of the acoustic noise generation mechanisms. Dynamic Mode Decomposition (DMD) is a flow decomposition method, which is suited to extract the spectral features of the flow-field. Thus, DMD is conceivably capable to extract the spectral flow features, which can lead to the formation of the screech tones. DMD is performed on Large Eddy Simulation data of a Mach 1.56 over-expanded supersonic jet expanding from a convergent-divergent nozzle.

¹*Linné FLOW Center*

Bernhard Semlitsch
KTH Mechanics

Date submitted: 02 Aug 2013

Electronic form version 1.4