**Abstract:** ***Wavepackets in subsonic jets.***

Recent investigations have highlighted the role of the coherent structures in the generation of the low-frequency acoustic noise in turbulent jets. These structures bear strong resemblance to instability linear wavepackets.
The main aim of the talk is to provide an overview of our recent results.

We study the frequency response of the flow to harmonic excitation. This formalism relies on the analysis of the linear, global resolvent operator, based on the fully compressible, axisymmetric, Navier-Stokes equations.
The meanflow fields for stability analysis as well as frequency-resolved fluctuations for comparison are extracted from : i) the jet experiment at PPrime Institute (Poitiers, FR), operating at $Ma=0.4$ and high Reynolds numbers $Re \approx 4 \times 10^5$; ii) a dataset from the numerical simulation of a jet at $Ma=0.84$ and low-moderate Reynolds numbers $Re \approx 5 \times 10^3$.

Our results reveal that the modal solutions obtained by frequency response analysis are in good agreement in both cases, thus confirming the conjecture according to which the coherent structures evolving in the potential core region of a turbulent jet can be described by linear wavepackets. Moreover, we will discuss the theoretical connection between the resolvent analysis and the stochastic framework.

In the remainder of the presentation, a brief overview on the analysis of the time-series associated to the wavepackets will be introduced, by discussing mainly the theoretical framework. In particular, the focus will be on the role of system identification in the analysis of nonlinear systems.

**Short CV**

Onofrio Semeraro is born in Napoli (10/9/83), where he obtained his MSc in Aeronautical and Astronautical Engineering in 2008.

He received his Licentiate (Feb. 2011) and PhD (Feb. 2013) in Mechanical Engineering, at the Royal Institute of Technology in Stockholm (SE). During his PhD studies, he was visiting researcher at the University of Princeton (May-Jun. 2011) and University of Salerno (Jul. 2012). He has been one of the five finalists for the *Leonardo da Vinci award* of the ERCOFTAC (European Research Community on Flow, Turbulence and Combustion) in 2013 (Cambridge, UK). In the September of the same year, he started his postdoc at Ladhyx, Ecole Polytechnique (Paris), where he is currently working in close collaboration with LIMSI-CNRS (Orsay) and the PPrime Institute of Poitiers.

His work mainly focuses on stability and control of transitional shear flows and turbulent jets, model reduction and system identification, optimal control of large-dynamical systems and – recently – biofluids.