TOSCA
Technology for Oscillating and Steady-State Combustion Analysis

The TOSCA Project
- Reproduce experimentally combustion instabilities such as “Humming” occurring in gas turbines
- Develop ad-hoc instrumentation in order to analyse the physics of the instability in details
- Contribute to the development of effective countermeasures in order to stabilise combustion and extend system life duration and performance

The experimental test rig
- Atmospheric premixed air-methane flame
- Venturi ½ + 45 degrees axial swirl at the injection
- Dump combustor with optical access
- Resonant cavity, quarter wave mode
- Amplification of the resonant modes 25Hz, 75Hz, 125Hz, 175Hz,… with the ONERA siren

Adapted measurement techniques and main results
- Phase-defined measurements
- High-speed schlieren visualisation ⇒ FLAME STRUCTURE
- Dual Laser-Vibrometry technique ⇒ DENSITY FLUCTUATION

More information
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Superposed flame dynamics with corresponding density fluctuation: 25 Hz resonance
Superposed flame dynamics with corresponding density fluctuation: 175 Hz resonance

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