LadHyX Seminar – February 19th, 10:45

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Linear modelling of flame instability

Flame dynamics involve many effects (hydrodynamics, acoustics, thermal expansion, reaction and more), and they are known to display unstable behaviour in a large variety of configurations. These instabilities can be underpinned by rich interactions, for instance between shear mechanisms, flame front dynamics and thermo-acoustic radiation. I will give a short overview of my work on these from the last five years. This includes a number of different scenarios where instabilities manifest themselves, investigated with linear analysis:

1. conical Bunsen flames of premixed methane or hydrogen,
2. a V-shaped flame issuing from an annular nozzle,
3. flames inside a channel, anchored to a bluff body,
4. thermo-acoustic instability in such a channel with bluff body, without ignition

The focus of the seminar will be on the last two configurations, in particular on the nonlinear interaction between thermo-acoustic modes and wake instability.