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Canards in combustion problems

Abstract:

A canard trajectory is a trajectory of a singularly perturbed system of differential equations if it follows at first a stable invariant manifold, and then an unstable one. In both cases the length of the trajectory is more than infinitesimally small. If a trajectory at first follows an unstable invariant manifold and then a stable one, it is called a false canard. The term “canard” (or duck-trajectory) was originally introduced by French mathematicians.

In a majority of the papers devoted to canards the term “canard” is associated with periodic trajectories. However, in our work a canard is a one-dimensional slow invariant manifold of a singularly perturbed system of differential equations if it contains a stable (attractive) slow invariant manifold and an unstable one. It should be noted that a canard may be a result of gluing stable (attractive) and unstable (repulsive) slow invariant manifolds at one point of the breakdown surface (a subset of the slow surface which separates its stable and unstable parts) due to the availability of an additional scalar parameter in the differential system. It is also possible to consider the additional parameter as a control parameter. This can guarantee the safety of combustion regimes.

Date:	Tuesday, November 5, 2013
Place:	Room C1/028
Time:	12:00

