

abtsract\_ICDERS19\_Dejoan\_Jumenez\_Kurdyumov

"Propagation of Symmetric and Non-symmetric Flames in Channels

by Anne Dejoan, Carmen Jimenez, and Vadim N. Kurdyumov

Center for Research in Energy, Environment and Technology  
(CIEMAT), Madrid, Spain

Speaker: Anne Dejoan

Symmetry loss of premixed flames propagating in narrow channels, planar and circular, is investigated. It is found that, depending on the flow rate, the Lewis number, the thermal expansion and the heat loss intensity, a bifurcation phenomenon can appear, leading to the existence of multiple solutions at the same set of parameters. In particular, the parametric influence on the critical bifurcation values is presented. Time-dependent simulations reveal that, as a general rule, symmetric flames are unstable with subsequent formation of non-symmetric flames. These results can be very important for practical applications, affecting, for example, the point of flashback.