

Microgravity combustion experiments for
comprehensive limit theory
and
kinetics study by micro flow reactor with
temperature gradient

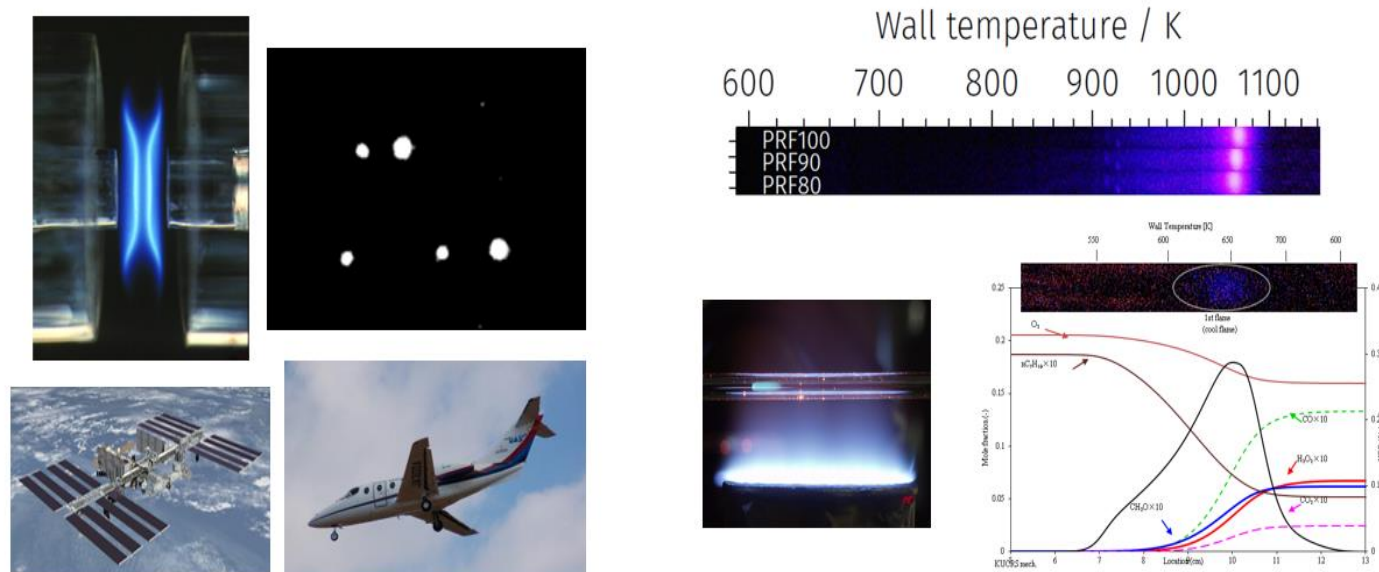
Kaoru Maruta and Hisahi Nakamura
IFS, Tohoku University, Japan

Monday, December 10, 2018 at 10h00
Salle de conférence, ICARE

Combustion studies at Energy Dynamics Lab., Institute of Fluid Science (IFS), Tohoku University will be introduced at the seminar.

At first, recent progress of slow-speed counterflow flame experiments under microgravity for comprehensive combustion limit theory which covers both conventional flammability limits and limit of flame ball will be discussed. Transitions from conventional flame extinction to flame ball-like phenomena, cellular counterflow flames and sporadic flames are discussed.

Secondly, kinetics studies using a micro flow reactor with a controlled temperature profile (MFR) will be introduced. Ignition-related characteristics of various fuels including hydrocarbons, alcohols, syngas and even weakly reacting mixtures could be applied to MFR. Recent studies using this method for validation and modification of reaction kinetics, stabilized cool flame, surrogate fuels, ammonia, etc. will be discussed.



Some images of Microgravity program (conventional counterflow flame, flame balls) and Micro Flow Reactor (Weak flames for PRF 80-100, stabilized cool flame of n-heptane/air mixture)