

||||| 特集：燃焼～単純化して探る複雑現象 |||||  
(原著論文)

## 燃料蒸気—空気予混合気中におかれた燃料液滴列を 燃え広がる火炎の微小重力実験

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### Microgravity Experiments of Flame Spreading along a Fuel Droplet Array in Fuel Vapor-Air Premixture

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#### Abstract

Microgravity experiments were carried out to investigate the effect of fuel vapor concentration of ambient gas on flame spread along a fuel droplet array. Ten decane droplets were simultaneously generated in a straight line and suspended at crossing points of X-shaped suspenders. Decane vapor-air mixture was filled in a combustion chamber. At onset of microgravity condition, the droplet at the one end was ignited to initiate flame spread. Flame spread speed was measured for various droplet spacings, initial diameters and gas equivalence ratios. It was found that the flame spread speed increases with the gas equivalence ratio. The flame spread speed at 0.7 in gas equivalence ratio is almost twice as large as that at 0.1 in gas equivalence ratio. Size effect on the flame spread speed at 10 in nondimensional spacing is almost negligible in the range of initial droplet diameter from 0.48 to 1.02 mm.