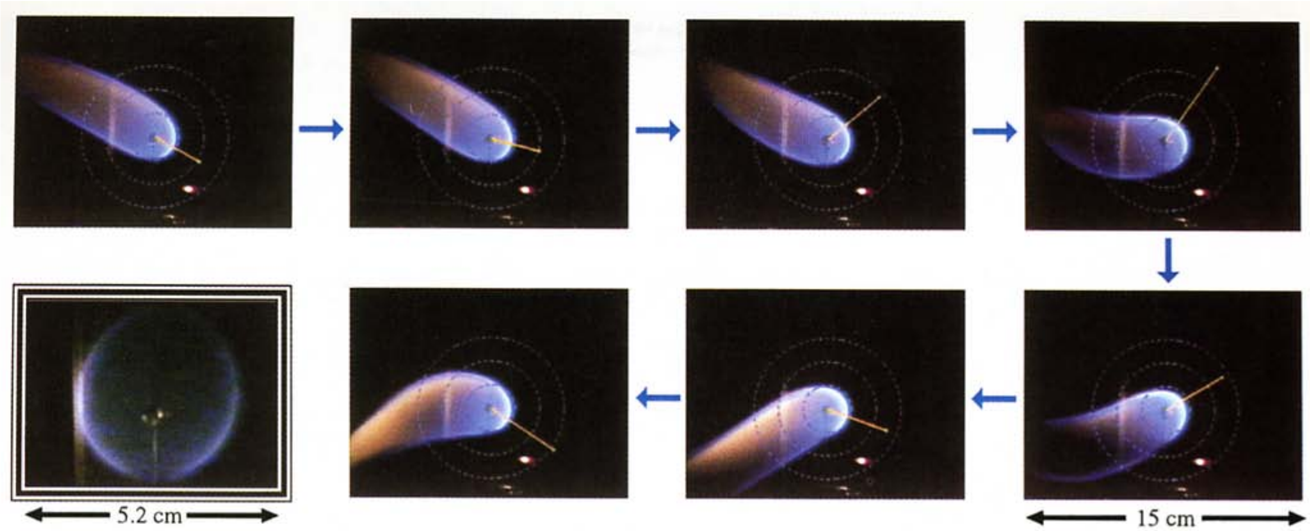

The Visualization of G-jitter Effects on a Burning Fuel Droplet in Reduced Gravity

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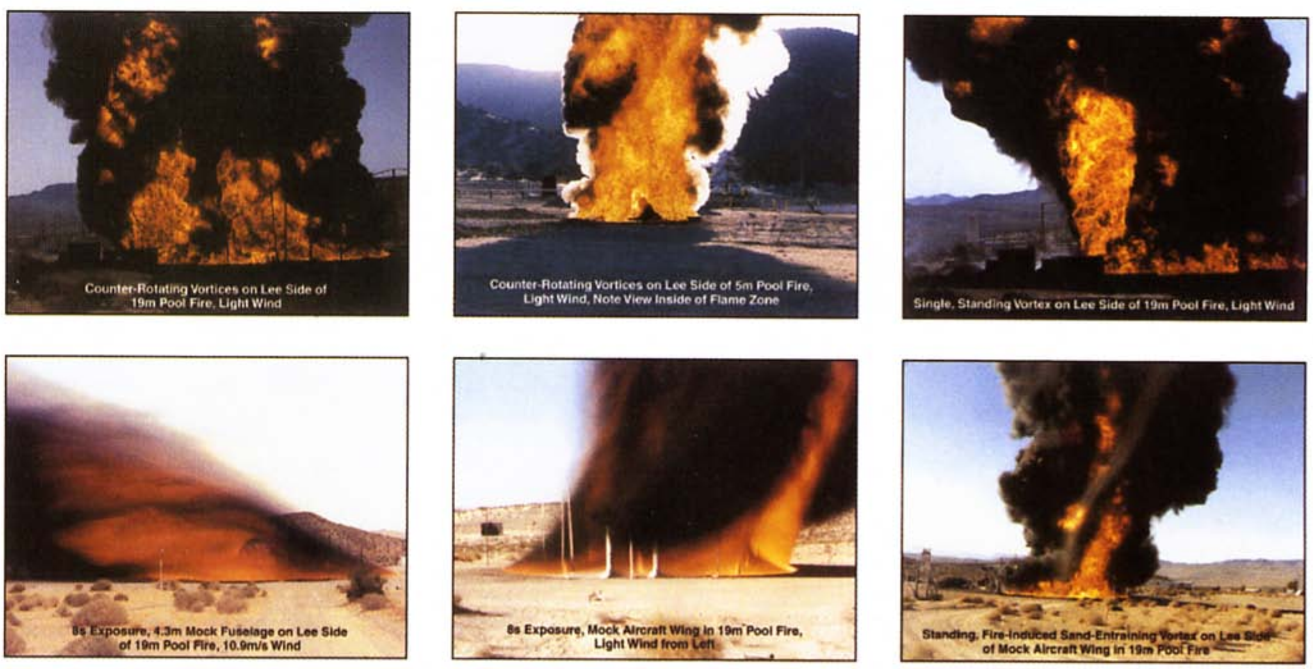
These flame images are from an experiment aboard NASA's reduced gravity research aircraft. The experiment studied the combustion of fuel droplets in reduced gravity. A constant size fuel droplet was simulated using a wetted porous sphere continuously supplied with fuel (n-decane). Instantaneous measurements of the acceleration were superimposed on the series of images showing the effect and time response of the flame. The variation of the gravity level (both magnitude and direction), or **g-jitter**, was due to aircraft acceleration–deceleration, vibrations, and atmospheric turbulence. The orange line is the acceleration vector originating at the center of the fuel droplet. Each graphically overlaid circle represents an acceleration magnitude of 10^{-2} normal (Earth's) gravity. Each frame is shown at 0.4 second intervals. This test was at .05 MPa pressure and a 15% oxygen 85% nitrogen ambient with a 5 mm diameter porous sphere. The last image shows a flame in 10^{-4} normal gravity. Here, at the lower gravity level and in the absence of g-jitter, the flame attained a near spherical shape.



Counter-Rotating Vortices on Lee Side of 19m Pool Fire, Light Wind

Counter-Rotating Vortices on Lee Side of 5m Pool Fire, Light Wind, Note View Inside of Flame Zone

Single, Standing Vortex on Lee Side of 19m Pool Fire, Light Wind

8s Exposure, 4.3m Mock Fuselage on Lee Side of 19m Pool Fire, 10.9m/s Wind

8s Exposure, Mock Aircraft Wing in 19m Pool Fire, Light Wind from Left

Standing, Fire-Induced Sand-Entraining Vortex on Lee Side of Mock Aircraft Wing in 19m Pool Fire

Flame Structure of Large, Hydrocarbon-Fueled Pool Fires

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These flame structures were observed during experiments performed to characterize the hazard posed by large fires, and to yield data, through the application of new and innovative diagnostics, required for the validation and further development of computational models which strive to predict this hazard.

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