“Can anything be modelled sufficiently accurately”

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54th UKELG One Day Discussion Meeting on

“Advances in Explosion Modelling”

Friday 30 October 2015

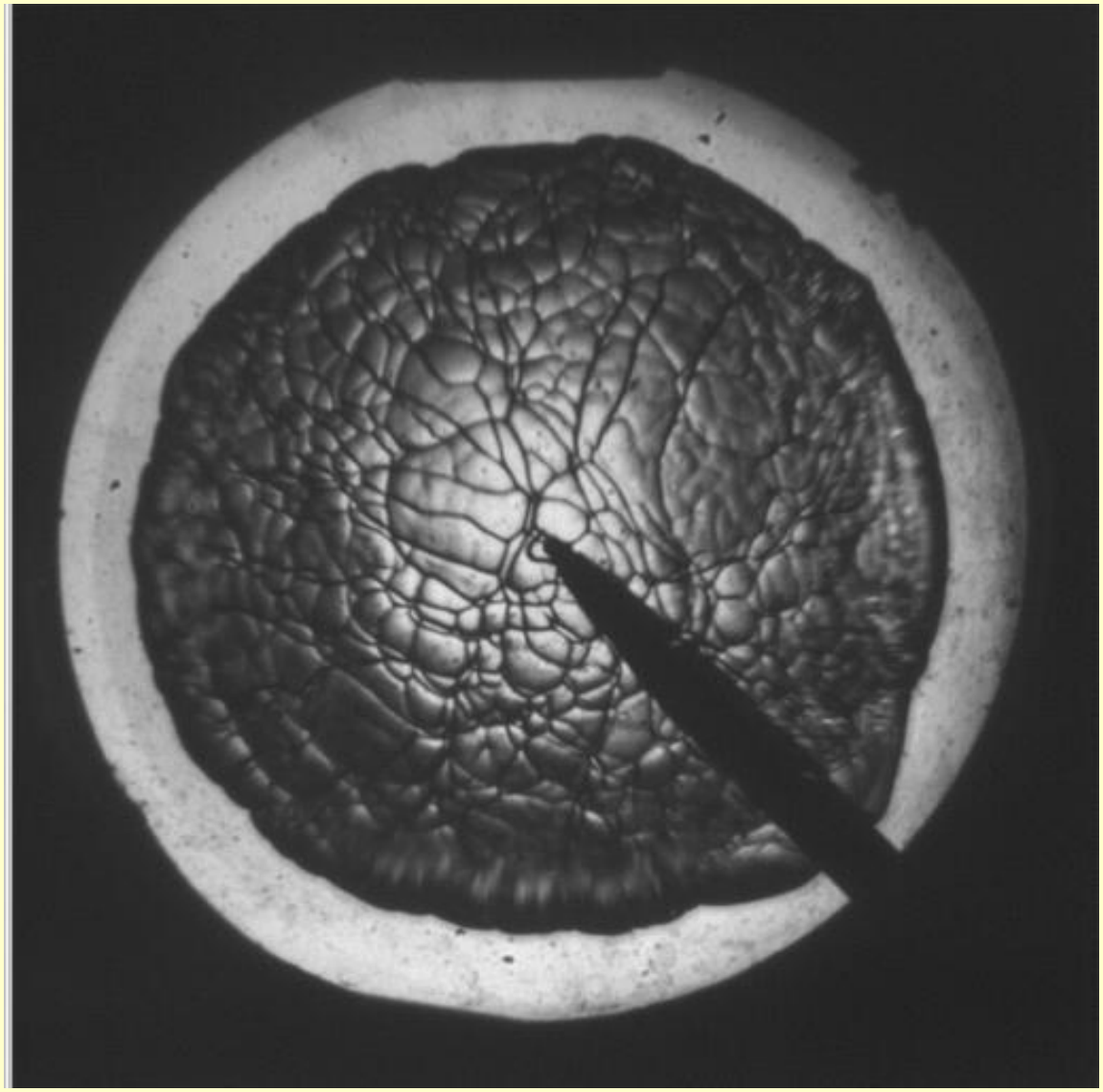
Arden House, Warwick University Conference Centre

“……dealing with circumstances for which there is no direct precedent”.

The Topics

- Laminar Instabilities
- Turbulent Burning
- Auto-ignition and Detonation
- Jet Flames

Laminar Instabilities (1)

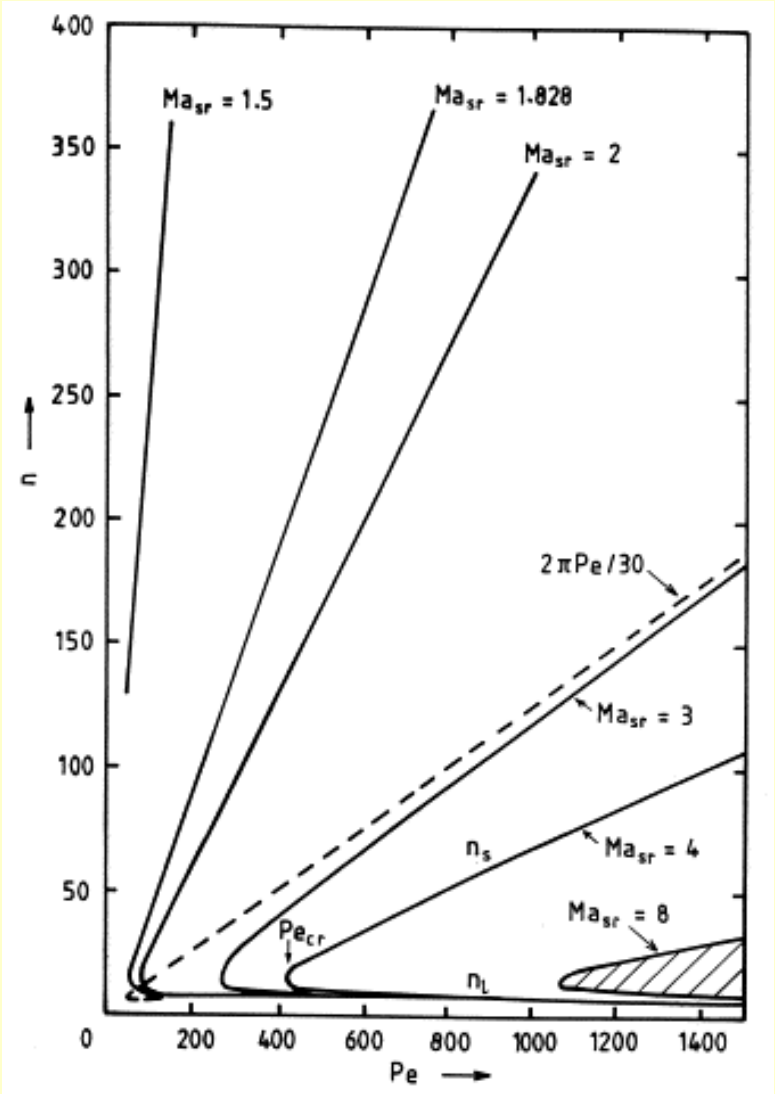


Laminar Instabilities (2)

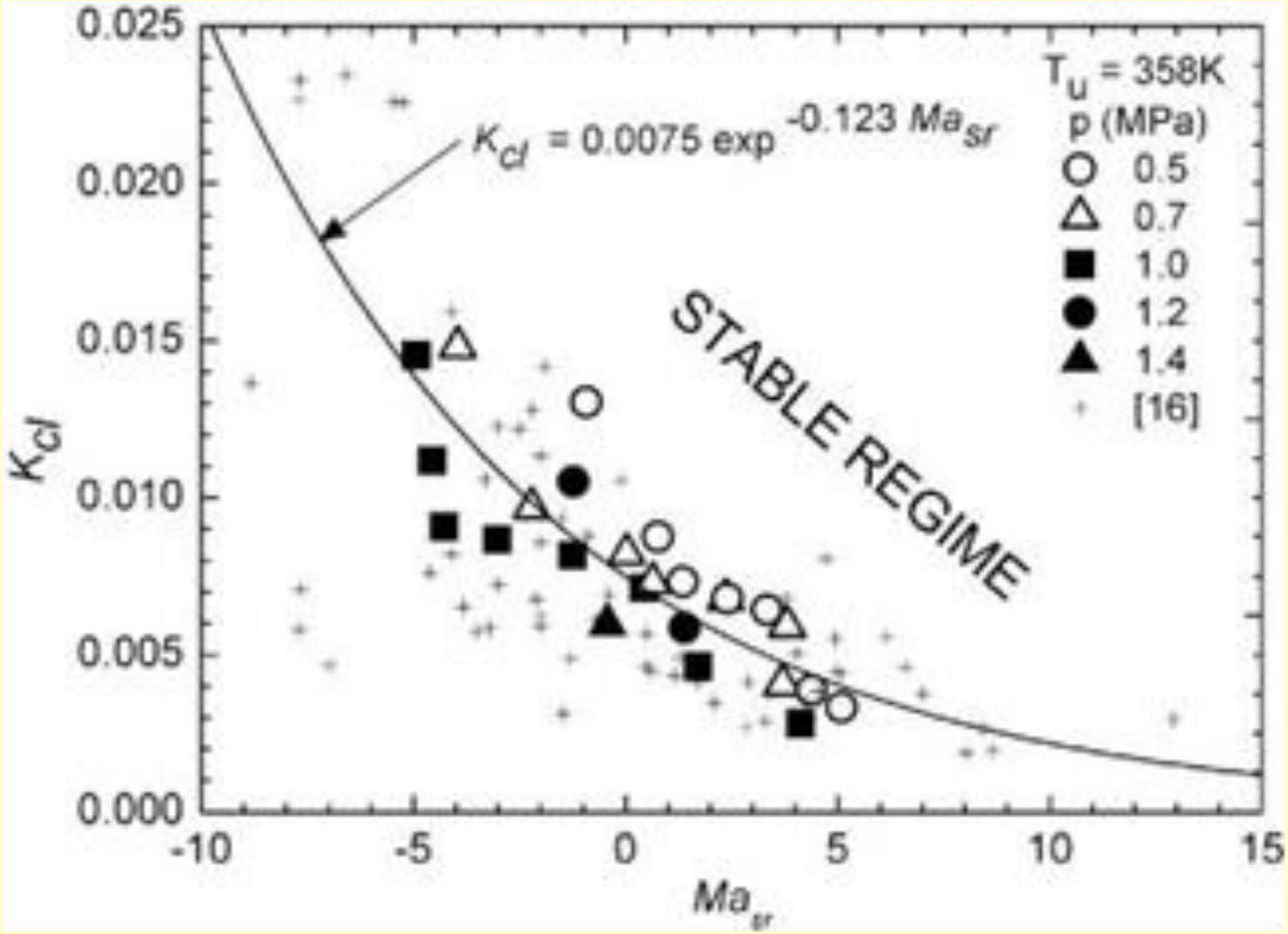
Flame area ratio

$= (n_s/n_l)^{D-2}$

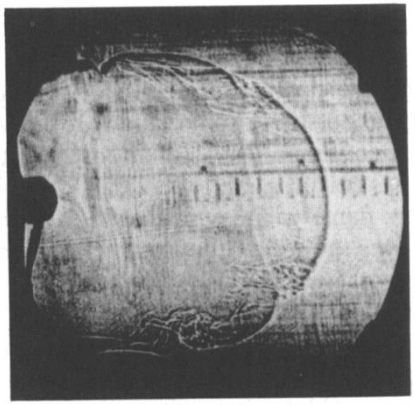
Fractal Dimension,
$D = 7/3$



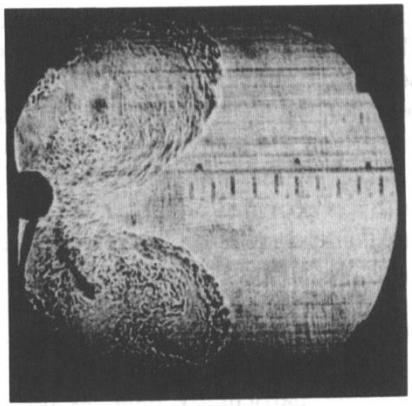
Laminar Instabilities (3)



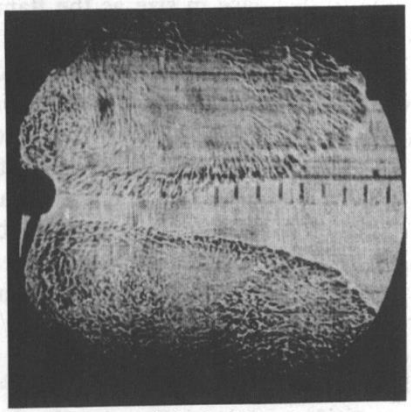
Laminar Instabilities (4)



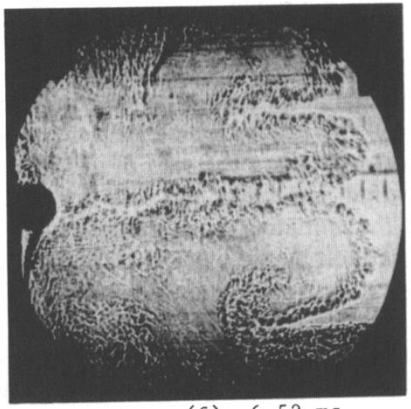
(b) 0.73 ms



(d) 2.8 ms



(e) 4.02 ms

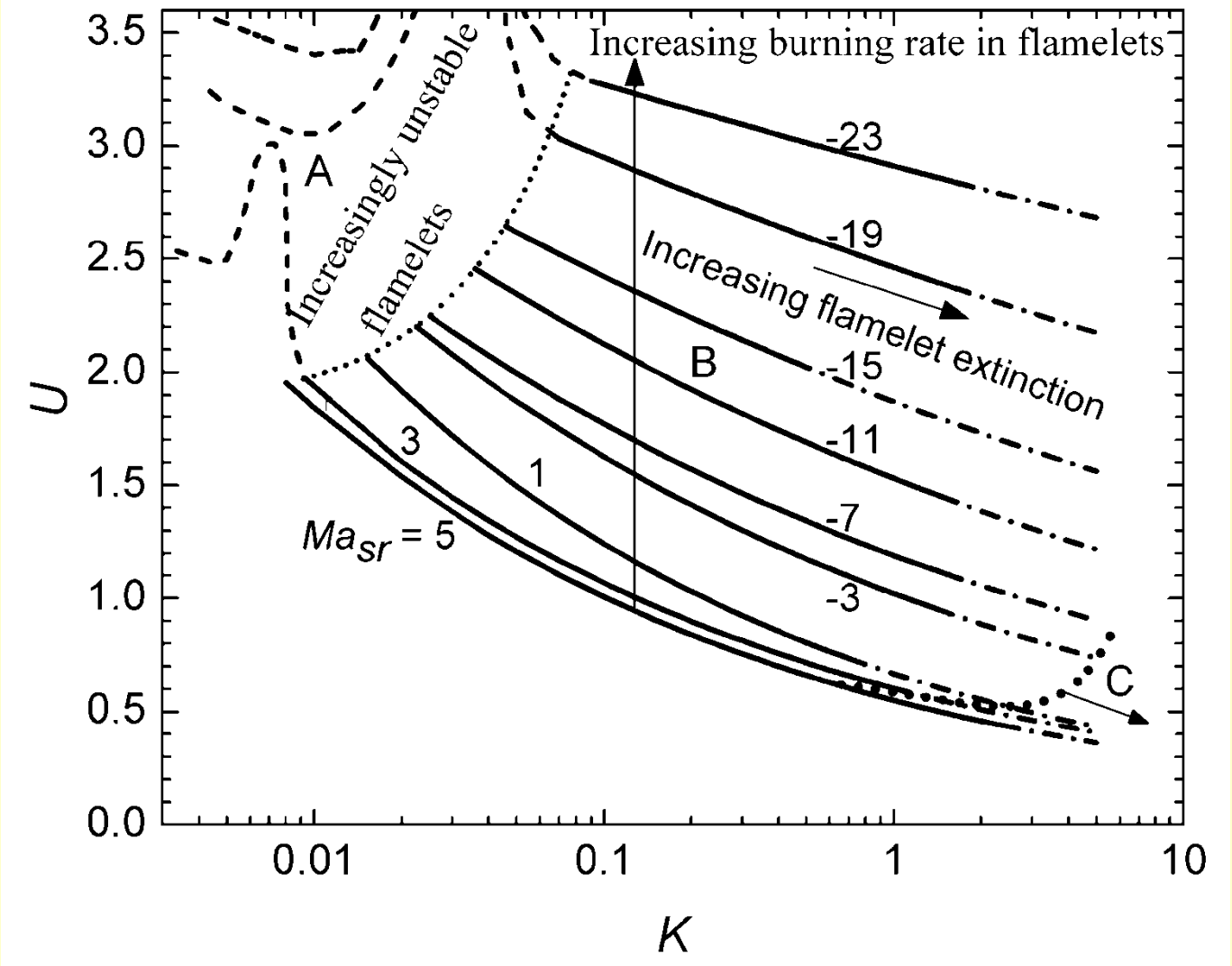


(f) 6.52 ms

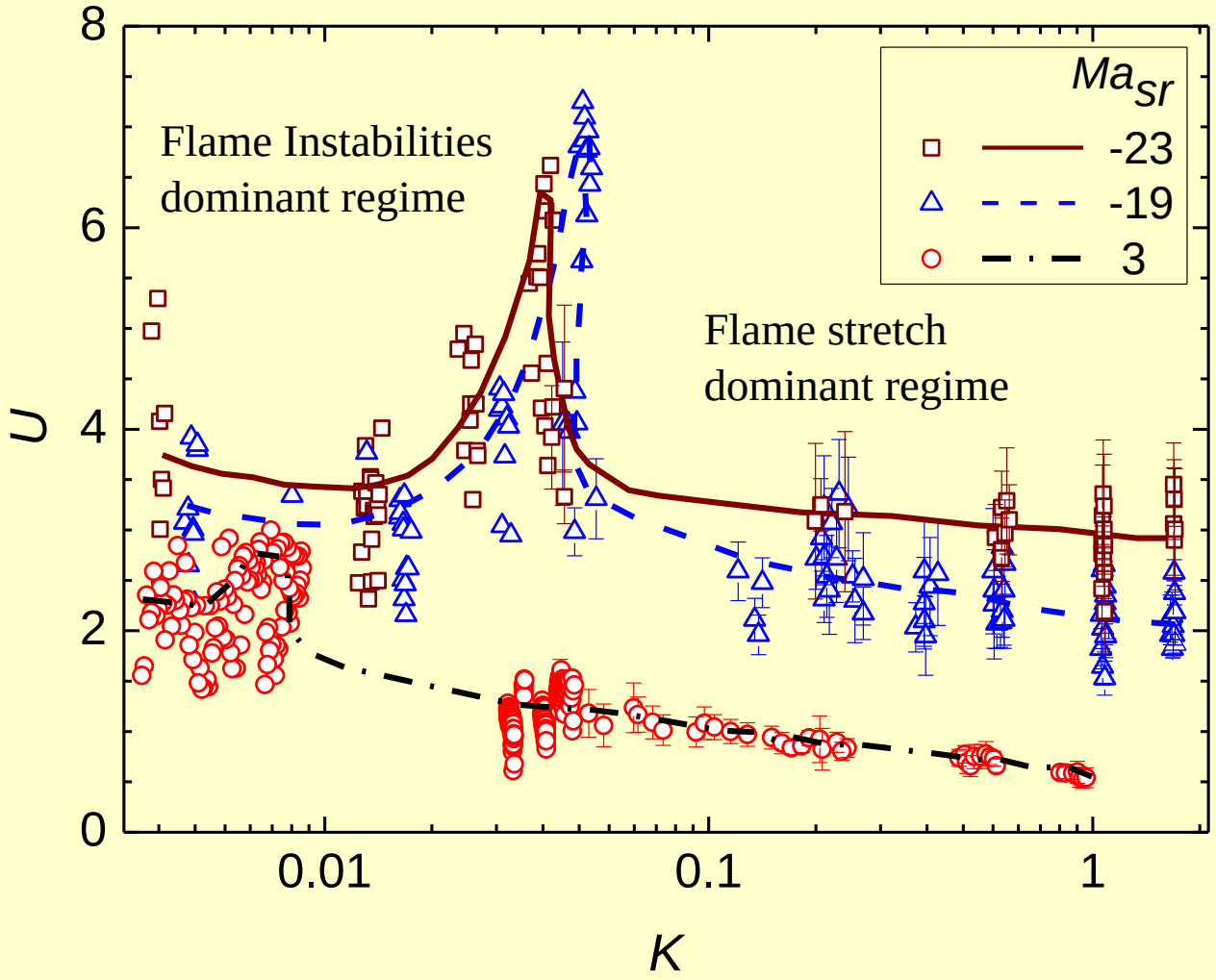
$$\nabla(1/\rho)\times\nabla p$$

Turbulent Burning (1)

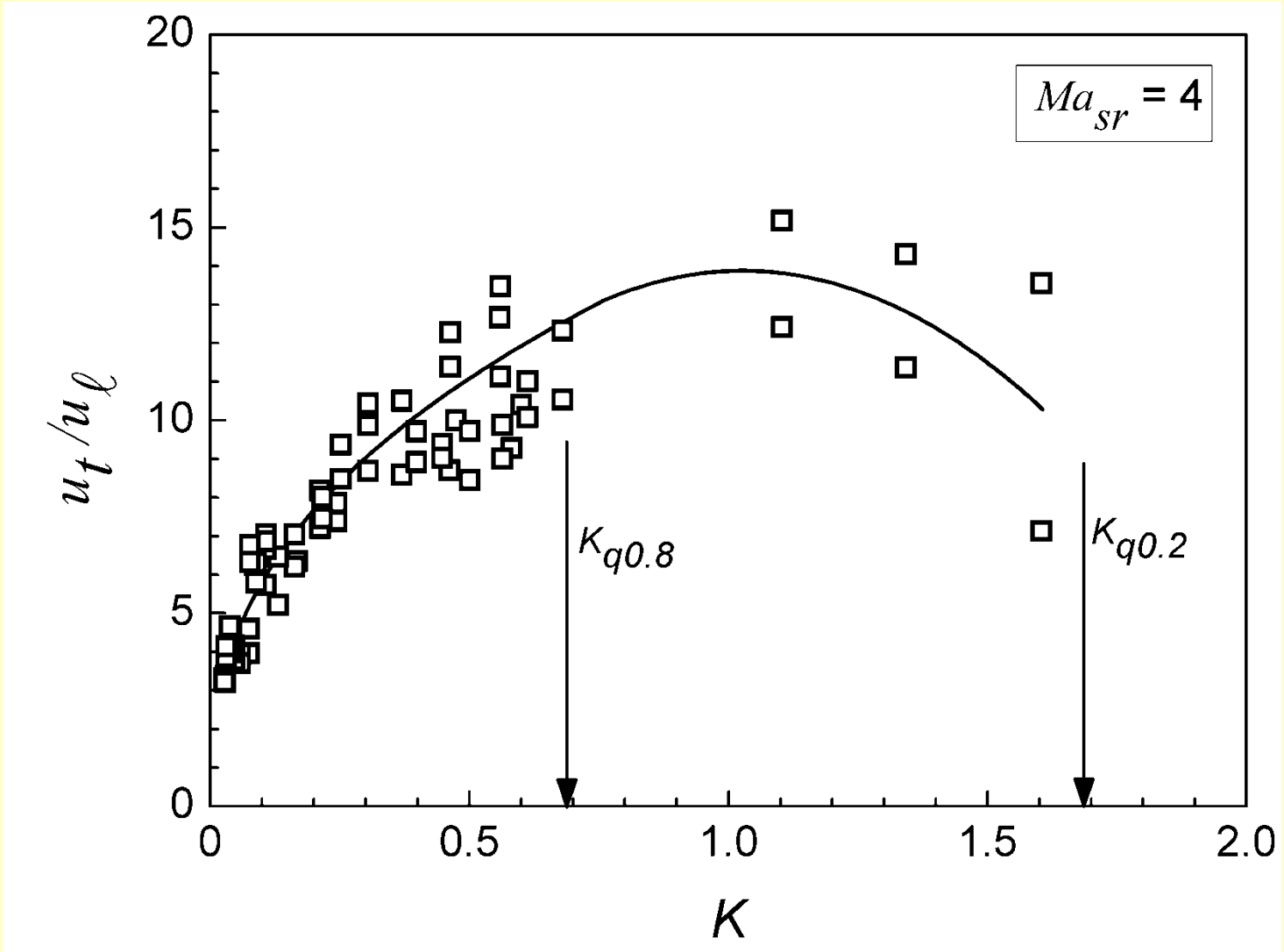
$U = u_t/u'$ $K = 0.25(u'/u_\ell)^2 R_l^{-0.5}$



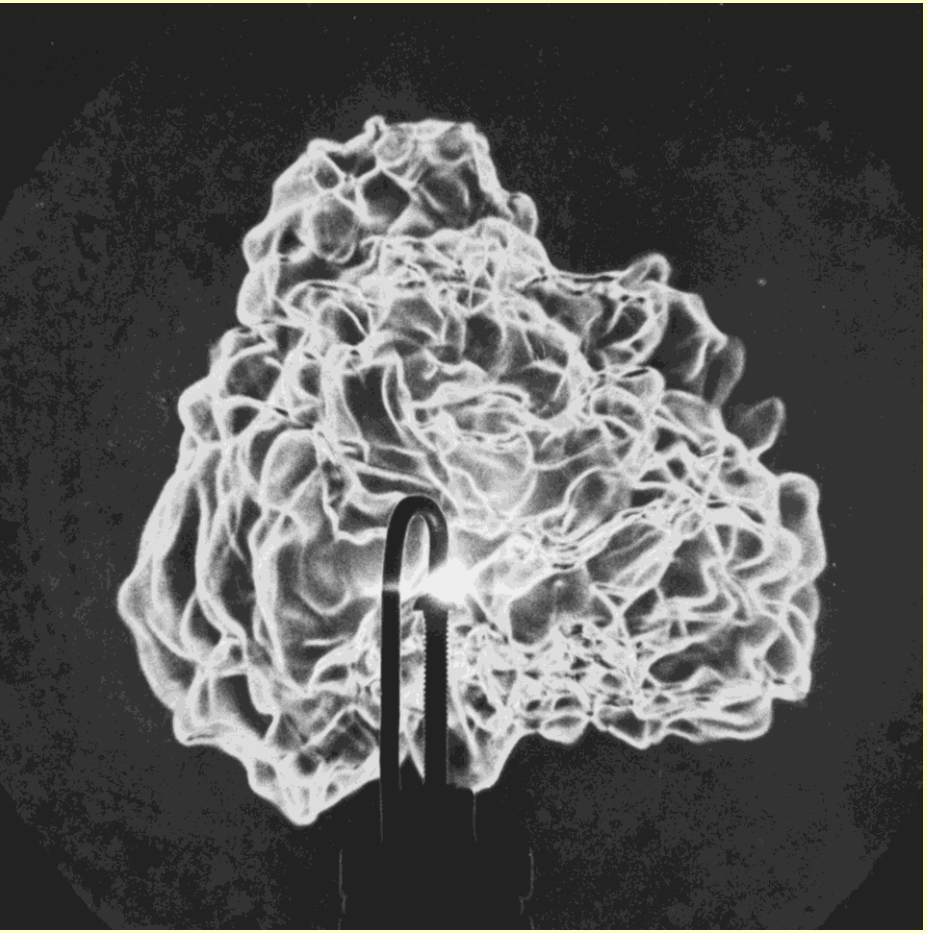
Turbulent Burning (2)

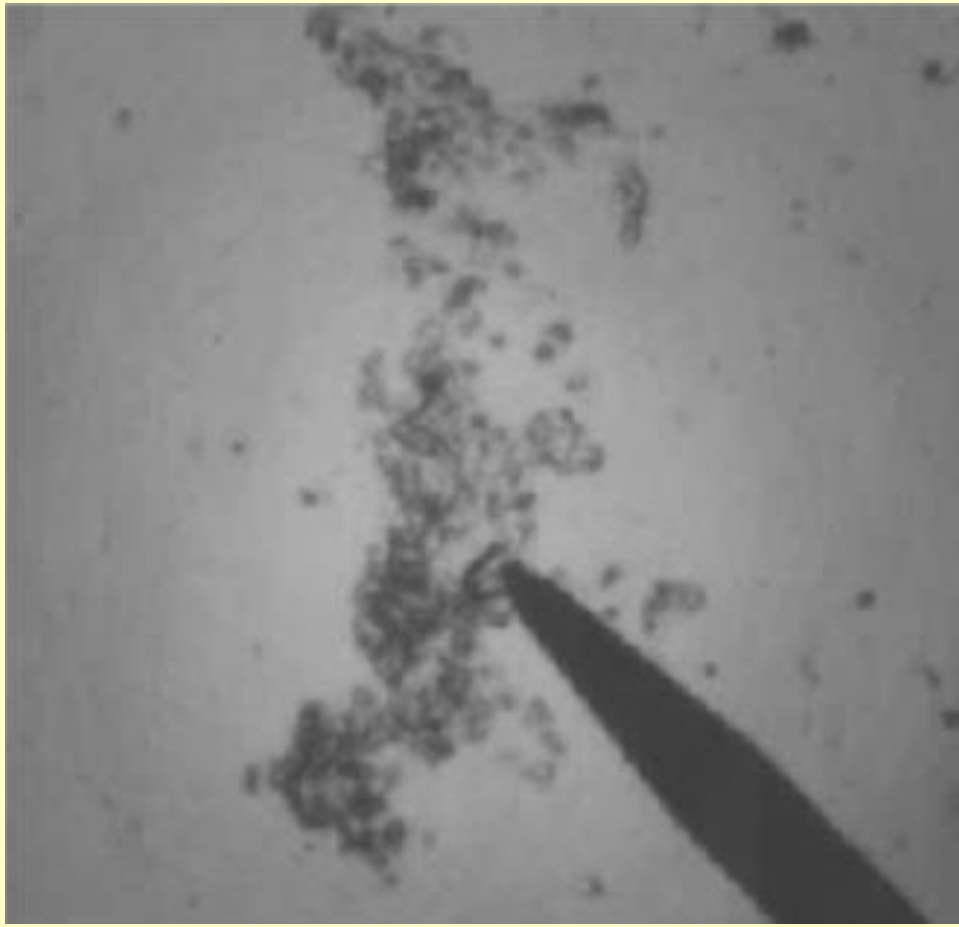


Turbulent Burning (3)

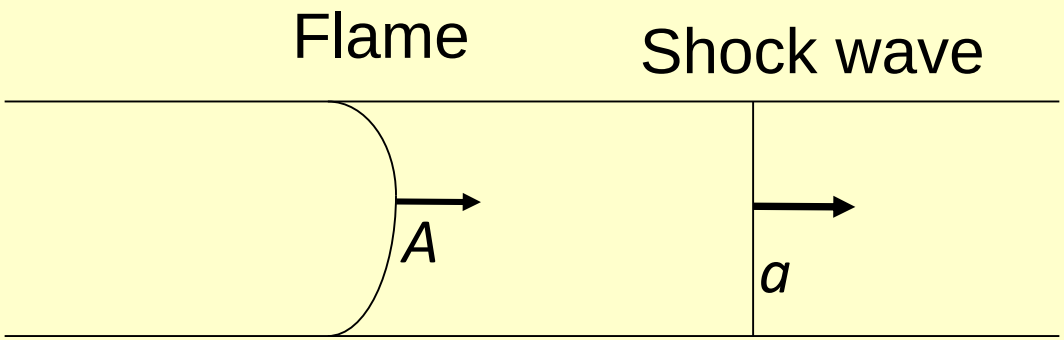


Turbulent Burning (4)

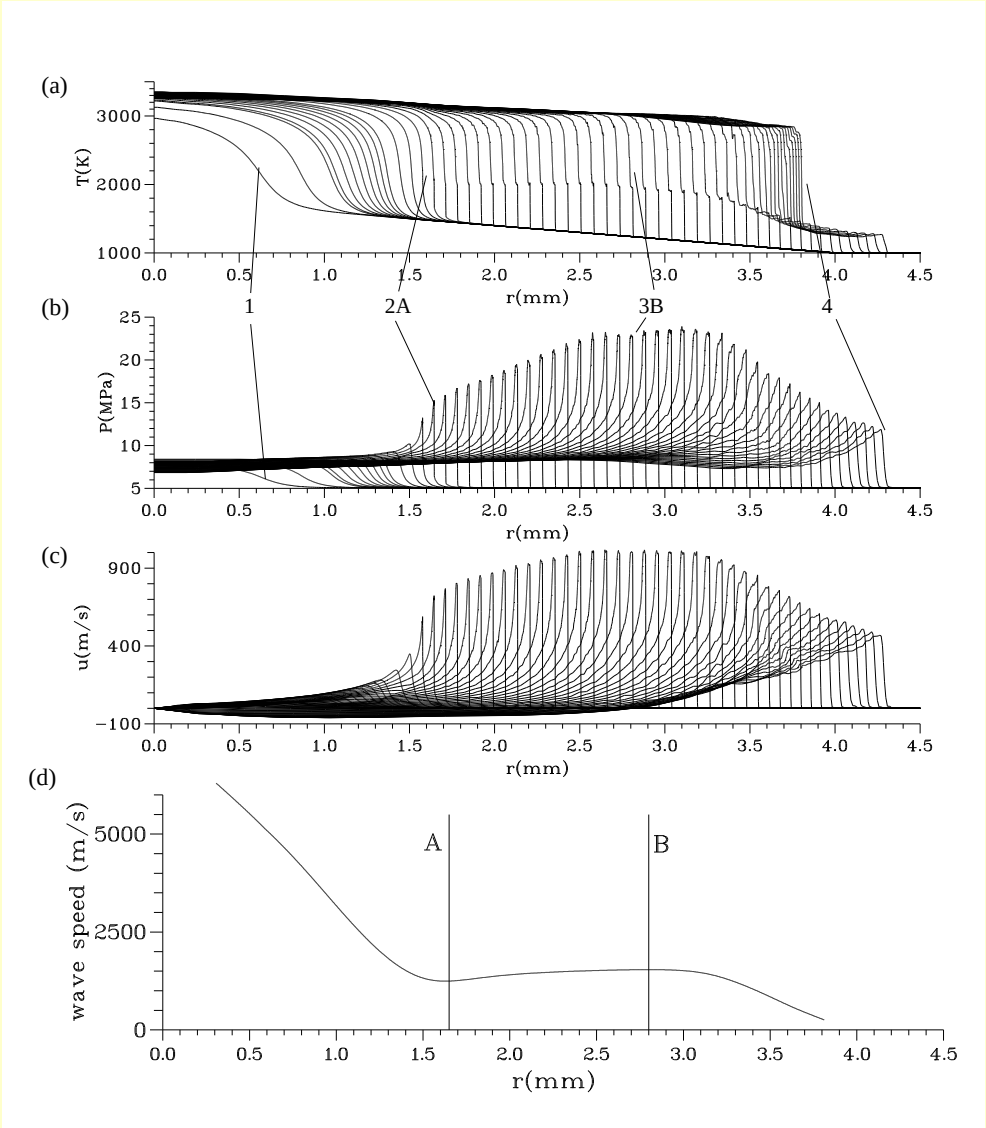




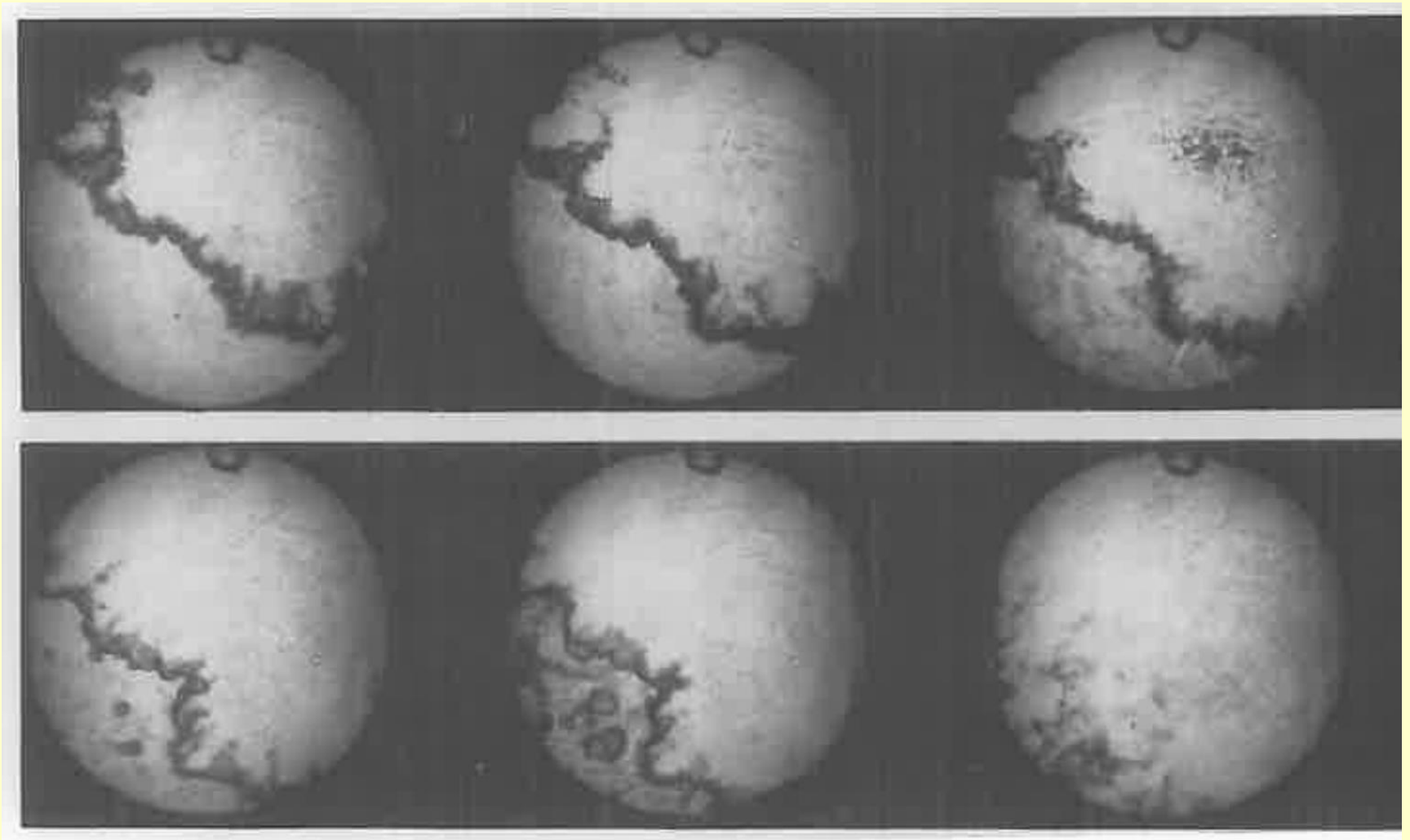
Turbulent Burning (5)



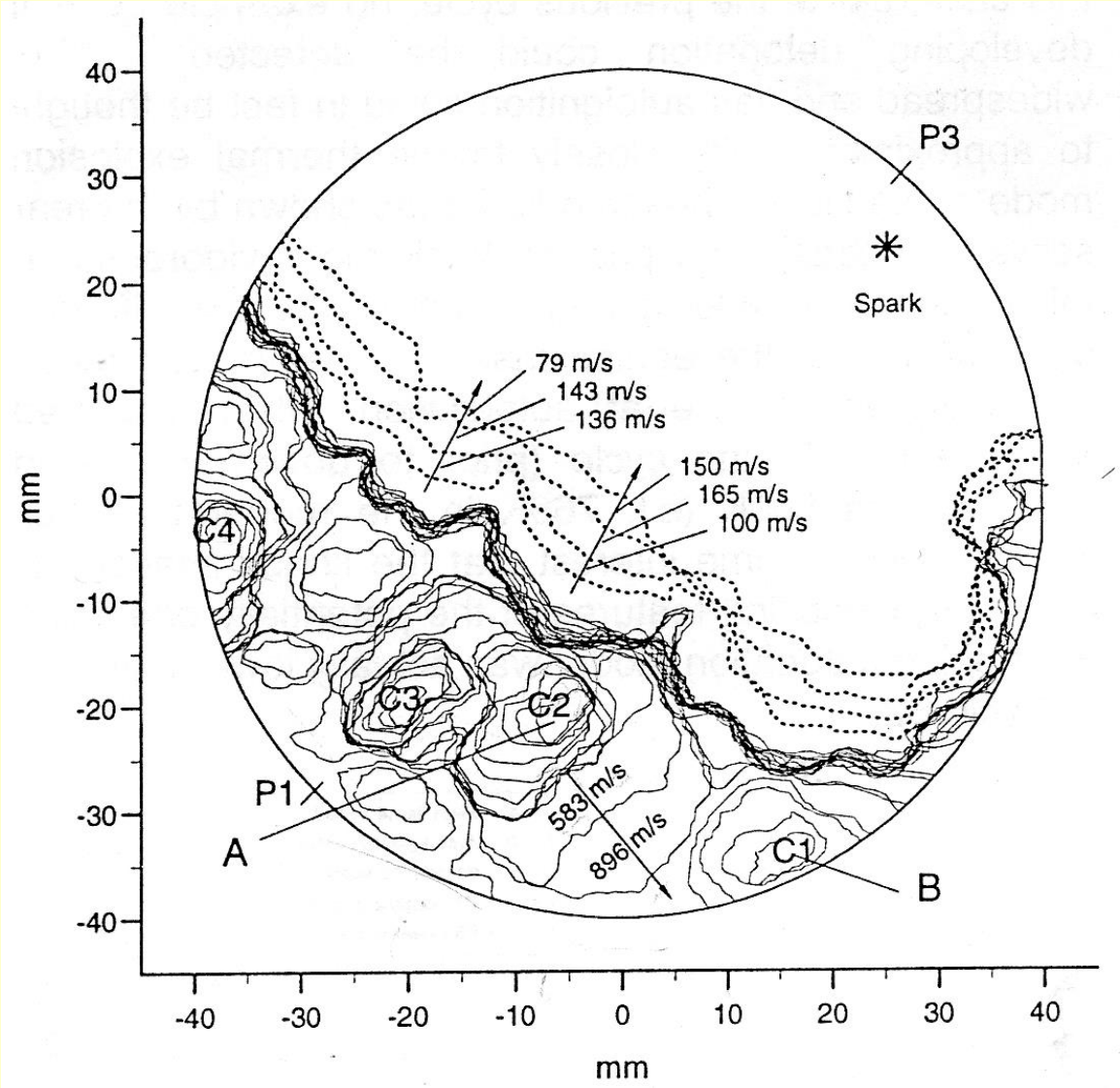
Auto-ignition and Detonation (1)



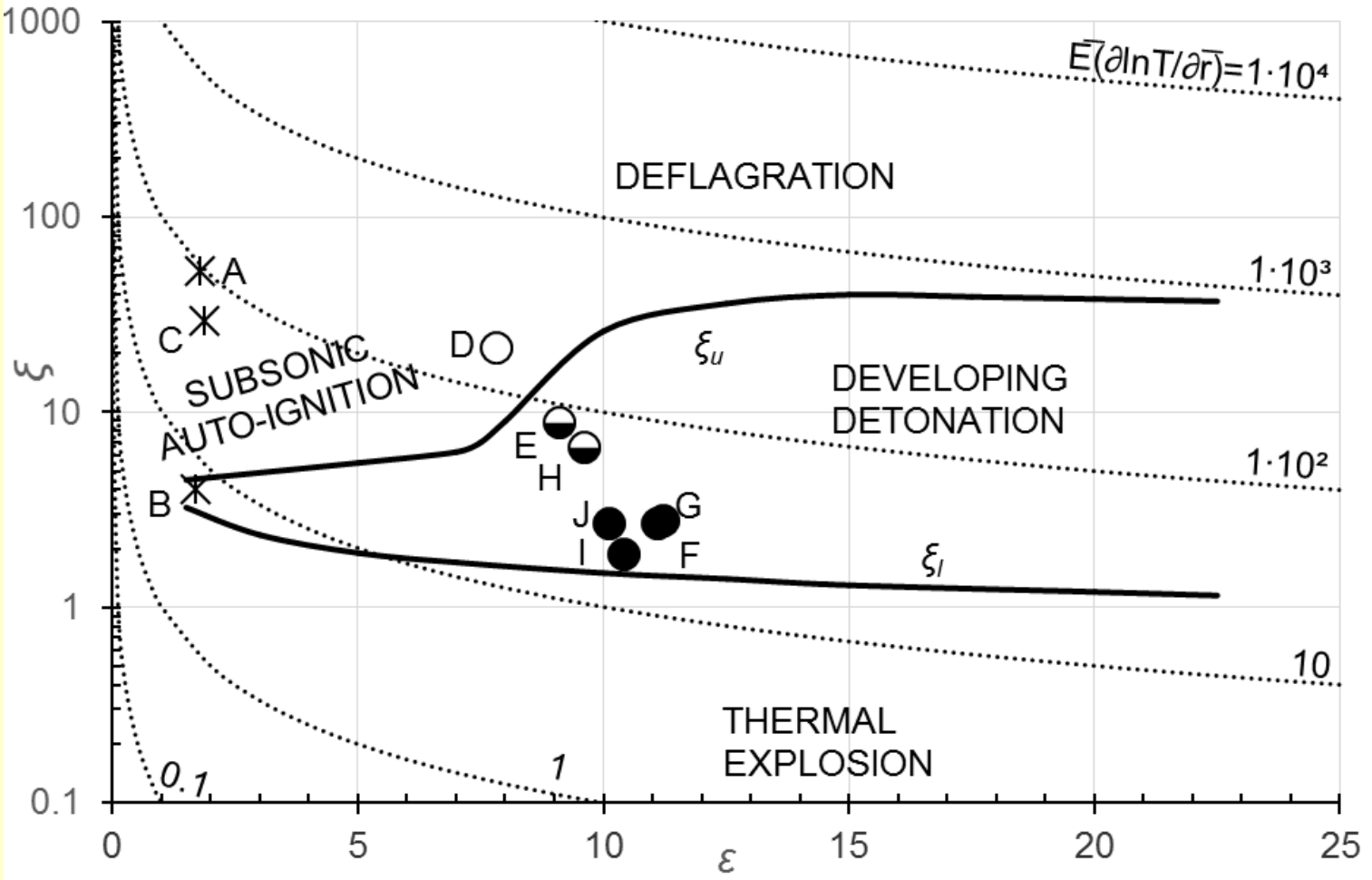
Auto-ignition and Detonation (2)



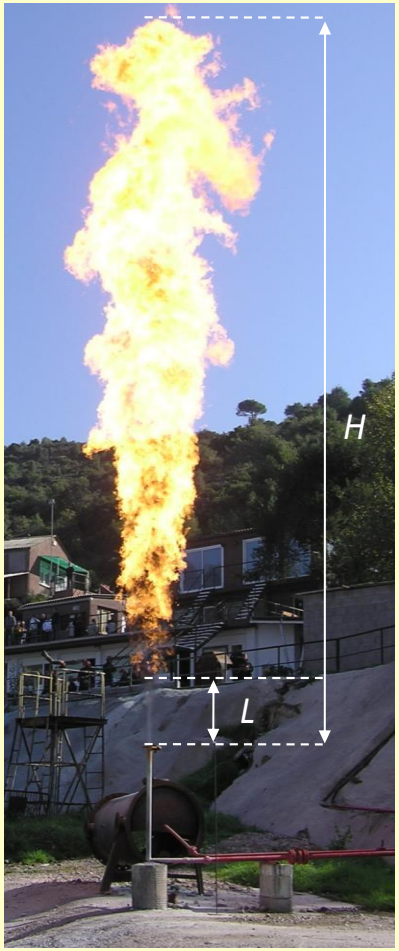
Auto-ignition and Detonation (3)



Auto-ignition and Detonation (4)



Jet Flames (1)



Jet Flames (2)