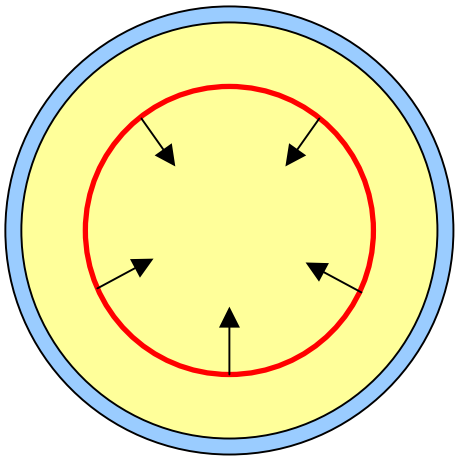
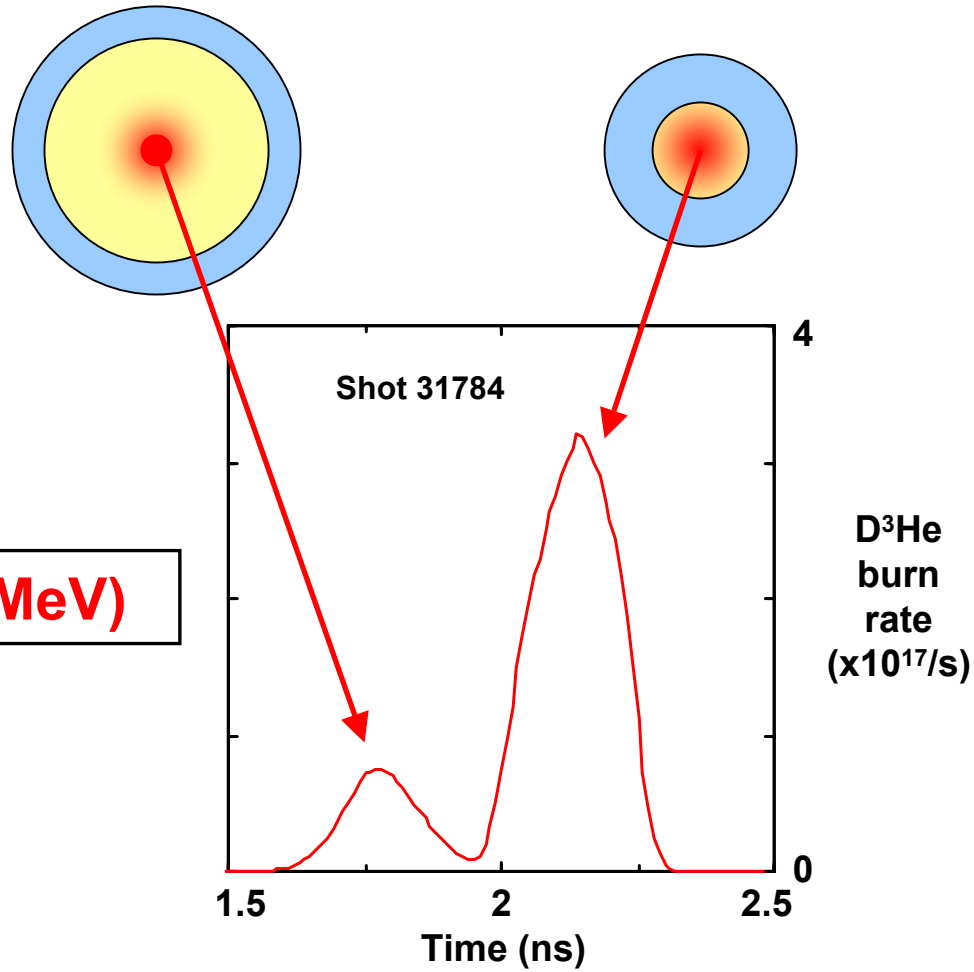
Utilizing Shock Burn to Study Omega Capsule Dynamics When Mix is Insignificant

Ingoing shock



Shock Burn

Compression Burn



$D + {}^3He \Rightarrow \alpha(3.6) + p(14.7\ MeV)$

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Related Talks:

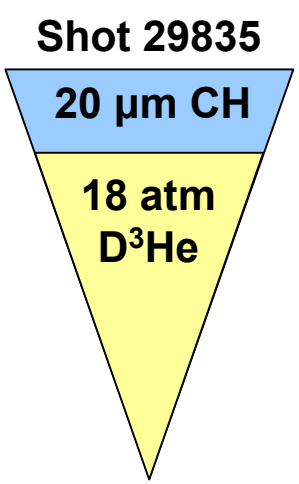
- **J.A. Frenje - FI2.004**
- **V.Yu Glebov - UP1.007**

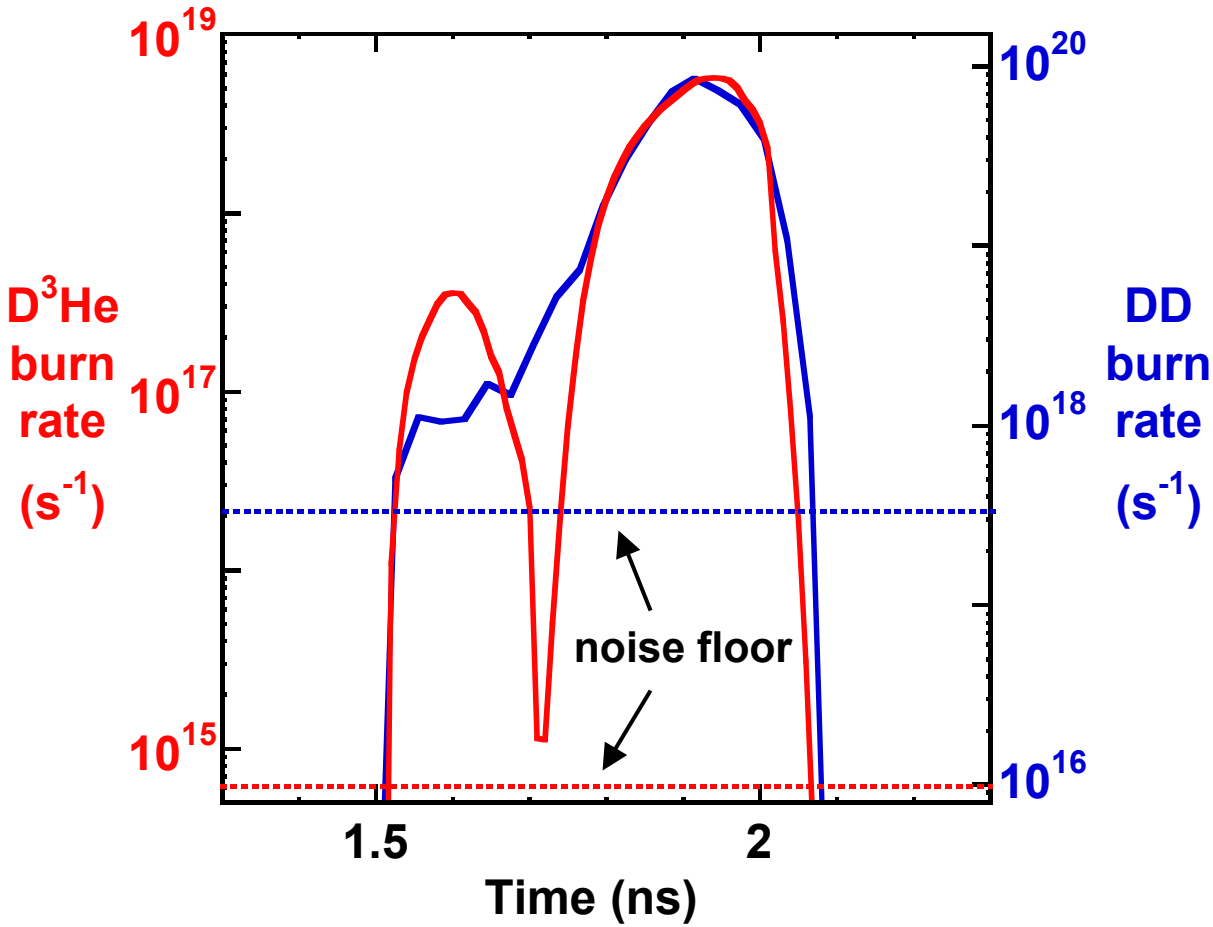
Summary

- D^3He burn rate is a new, sensitive window for studying capsule dynamics at shock burn
- From D^3He shock bang, an accurate estimate is obtained of the coupling between the radiation drive and the imploding capsule
- During the shock burn, capsule burn dynamics are largely free of mix, *and clean* simulations will be at their best
- Shock burn determines several experimental quantities that are readily contrasted to simulations:

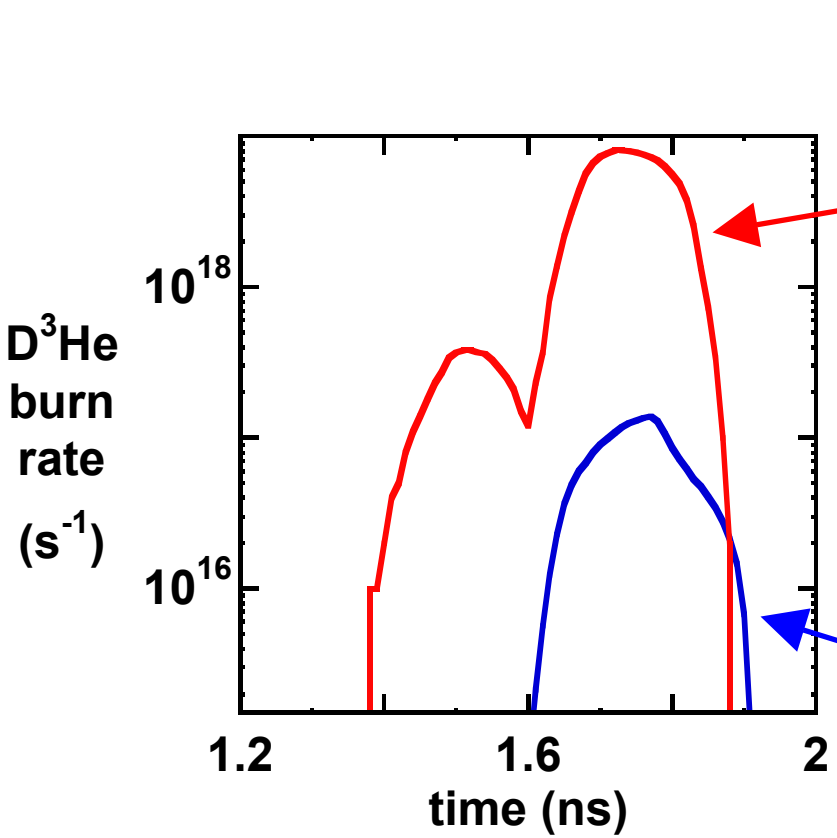
    1. Shock bang
    2. Shock duration and burn history
    3. Shock yield

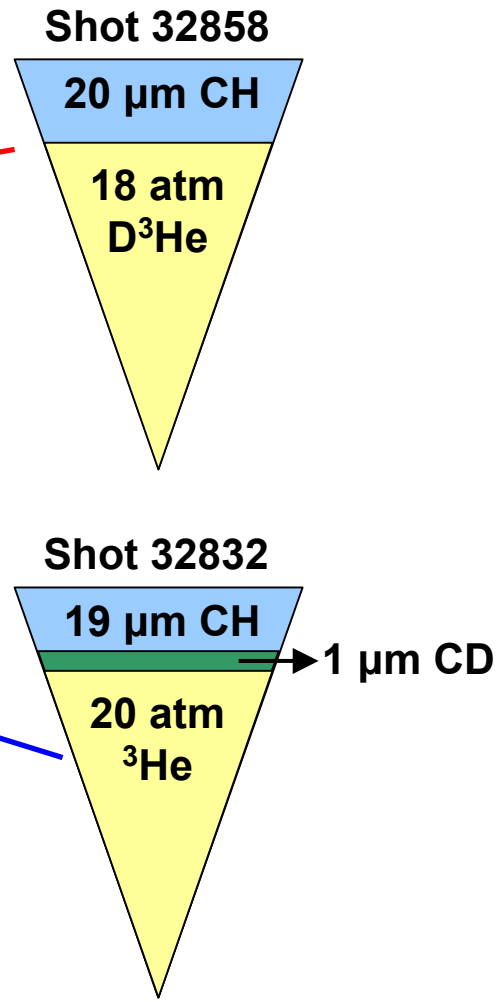
The strong T dependence of D^3He reactions sensitively amplifies the shock burn





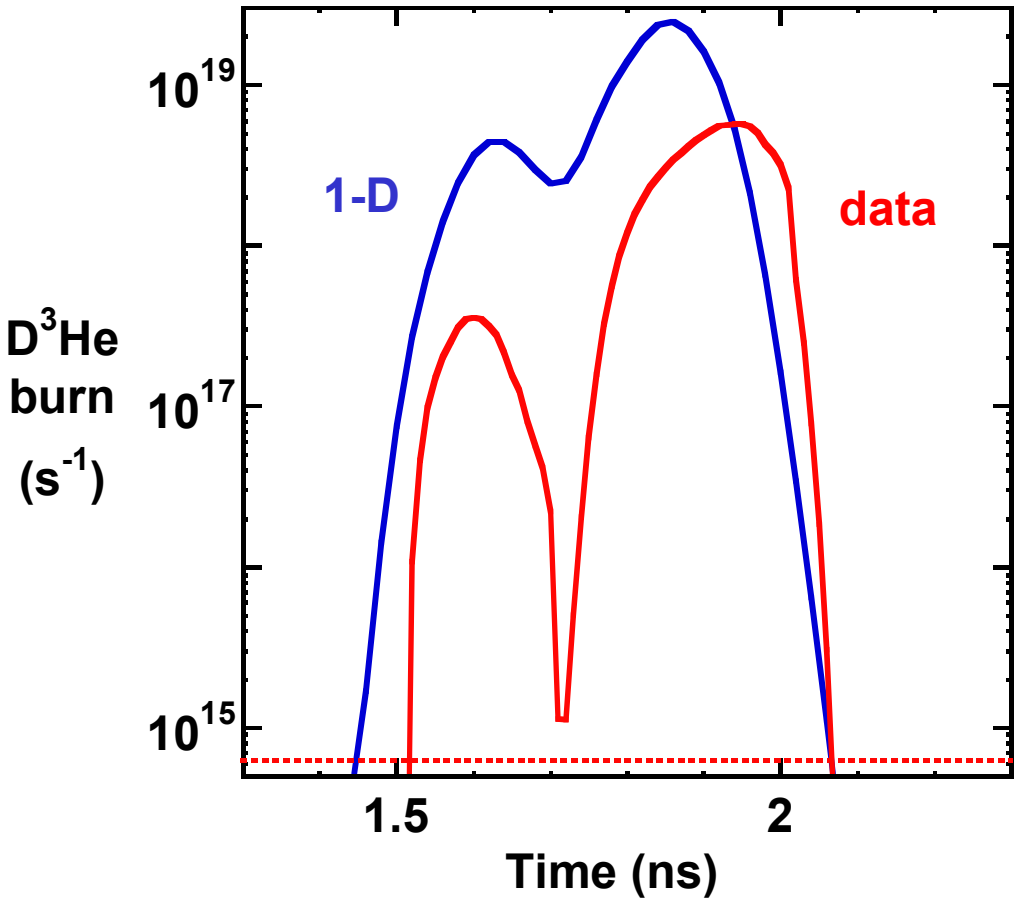
Minimal mix occurs during shock burn





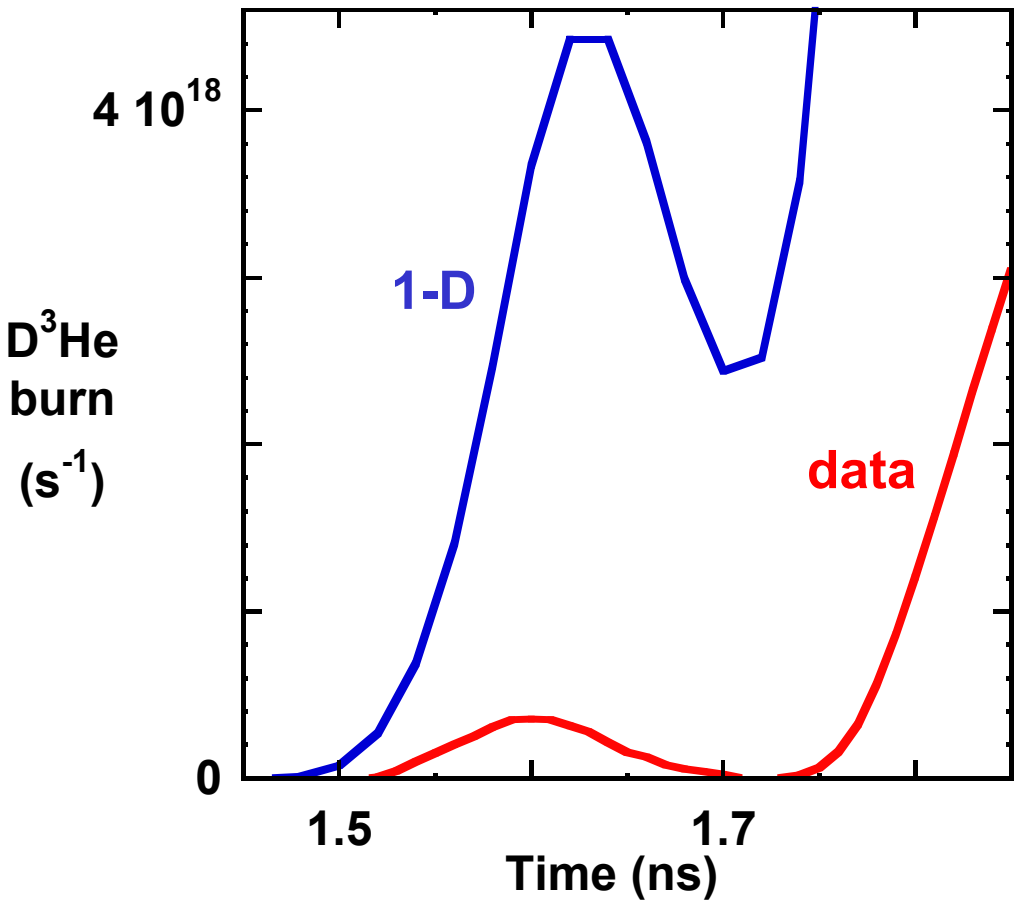
R. Rygg, et al, CO2.009

1-D LILAC is compared to D^3He burn data



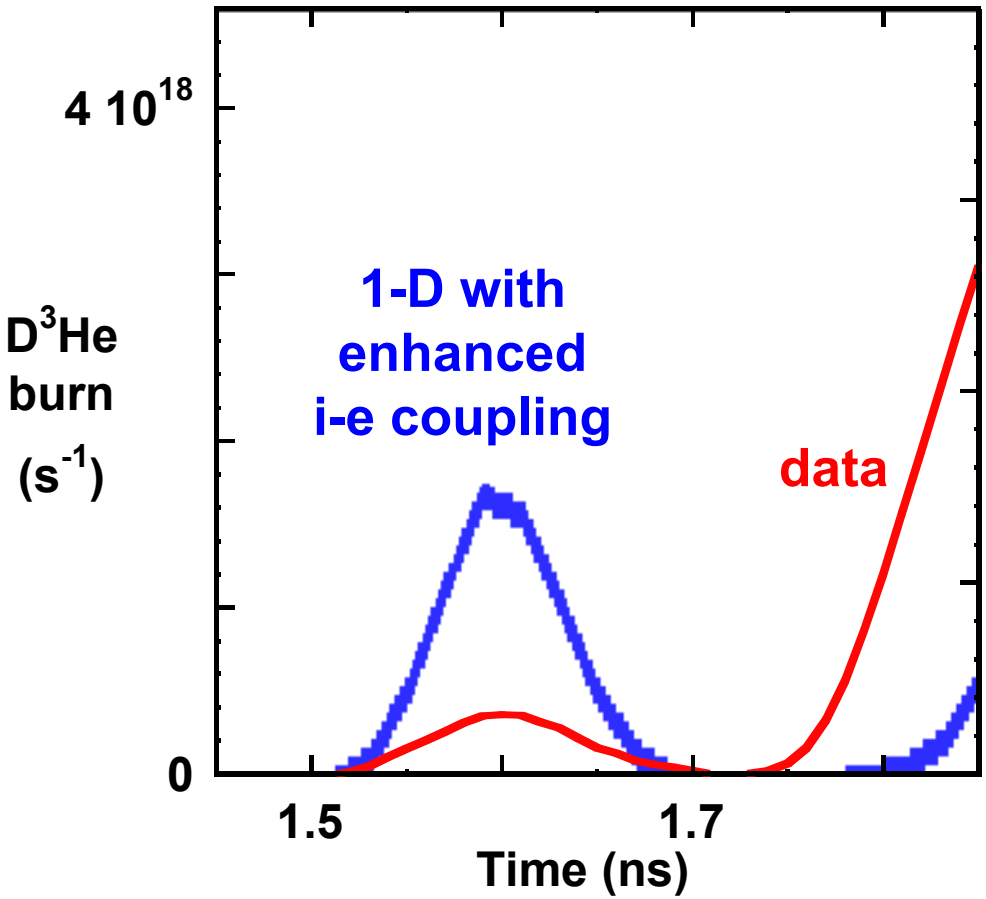
Shot 29835

At shock burn there are 3 discrepancies between experiment and LILAC



- Simulated yield:
  ~ 10 times experiment
- Simulated burn width:
  ~ 50% larger
- Simulated burn:
  fails to quench

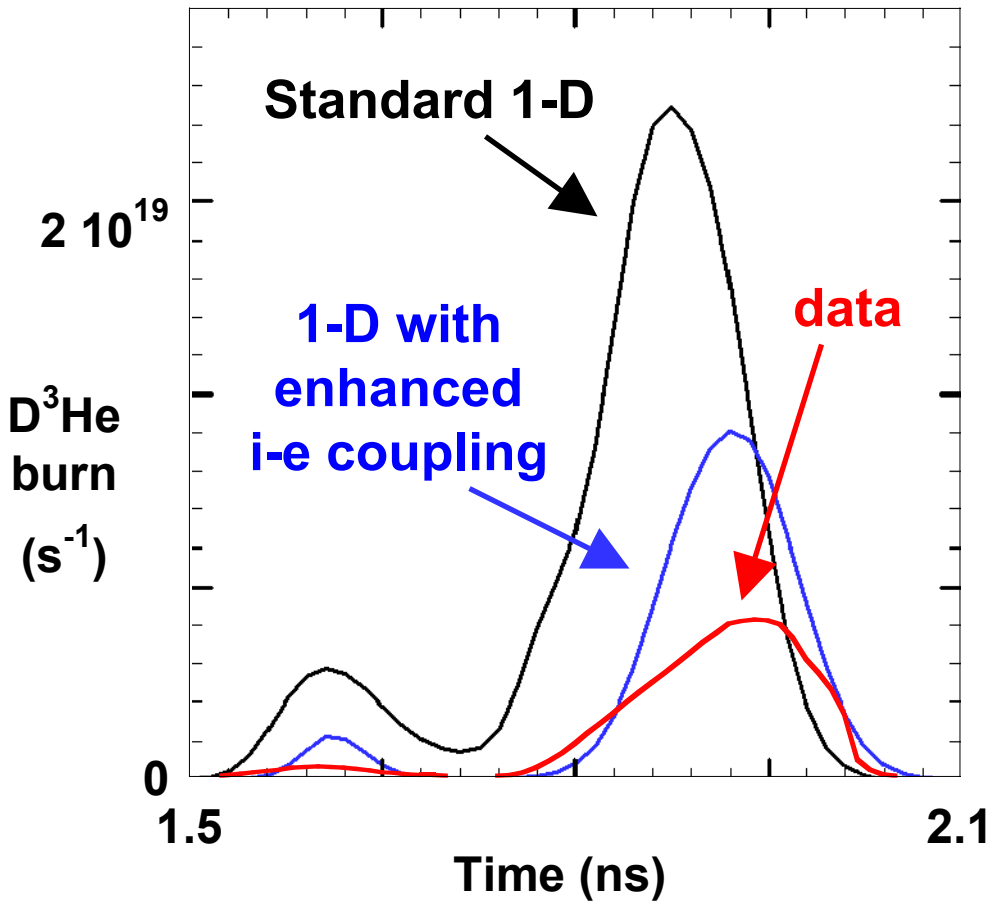
Increasing the ion-electron coupling in LILAC at shock burn reduces all discrepancies



- Simulated yield:
  ~ 3 times experiment
- Simulated burn width:
  matches experiment
- Simulated burn:
  quenches

Interestingly, enhanced coupling also simulates the data better for compression burn

Shot 29835



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