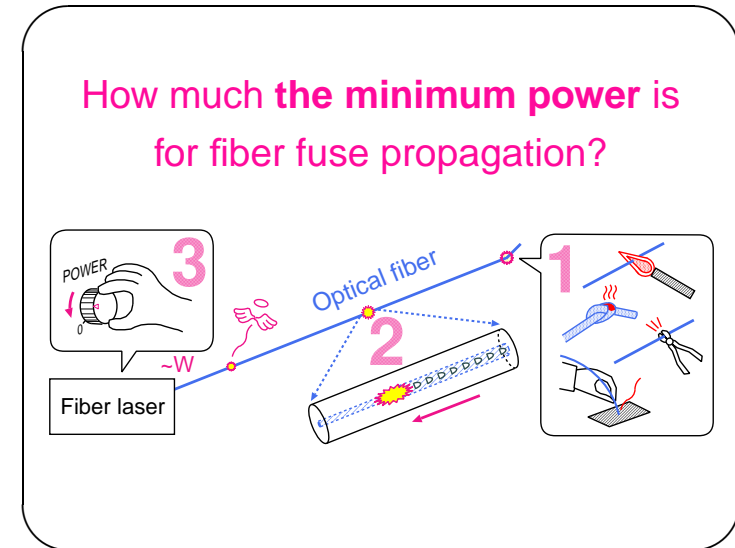


Slide 1



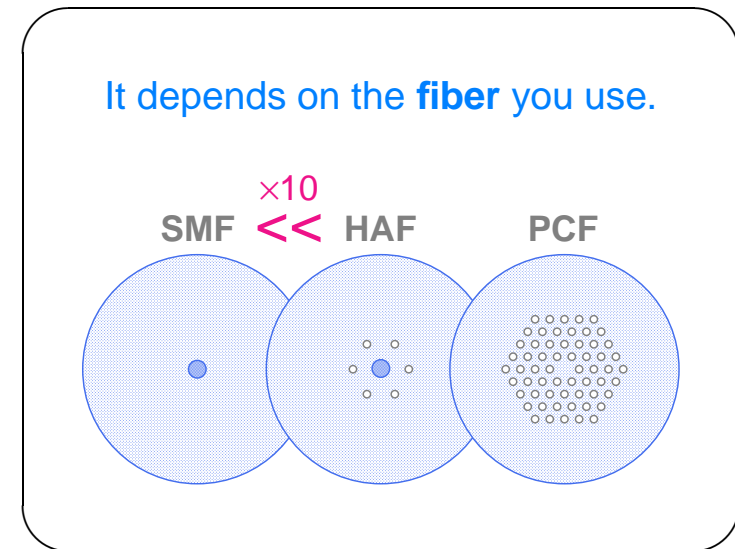
Slide 2

Date: 8 Mar. (Thu) 2012, 16:30–17:00 (PSC)

Venue: Los Angeles Convention Center (Room 503)

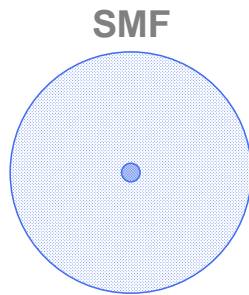
Abstract

The propagation threshold power through a white tight-buffered fiber was found to be 3% less than that through an acrylate-coated fiber because the pigments in the buffer backscatter the visible emission that pumps a fuse.



Slide 3

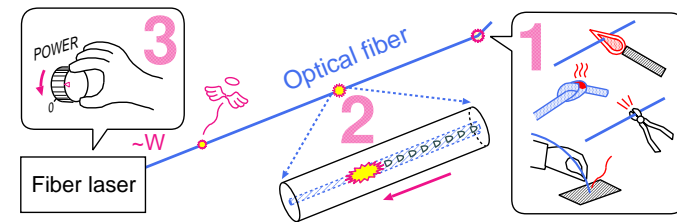
How much the **minimum power** is
for fiber fuse propagation?



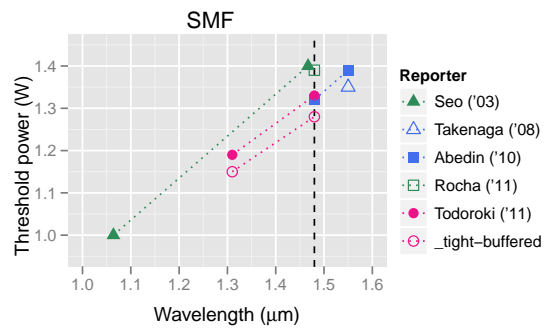
Slide 4

Initiation

Difficult to ignite a fuse at $\sim P_{th}$



Slide 6

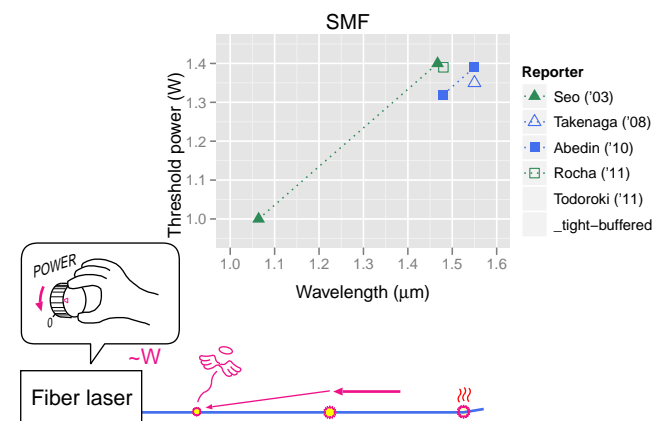


P_{th} also depends on the **reporters**.
Why?

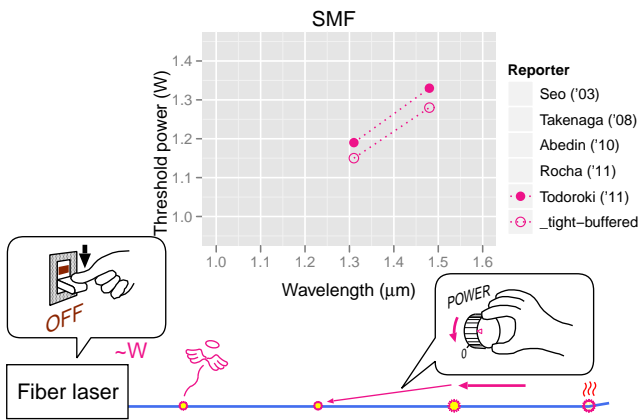
Slide 5

Their definition

Power when a fuse disappeared



Slide 7

My definition**Minimum power for propagation**

Slide 8

OVERVIEW

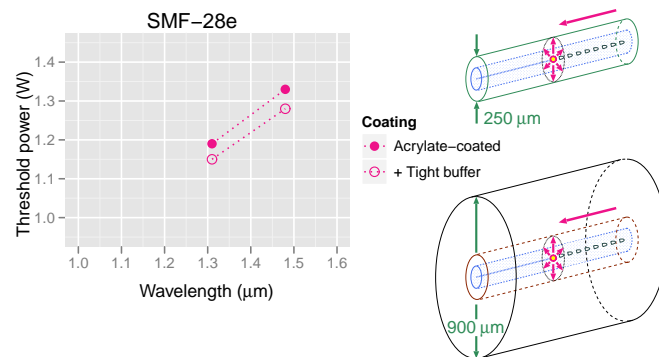
Partially self-pumped fiber fuse propagation

Energy balance*How the tight buffer gives some energy to a fuse?***Evidence***How this mechanism at $\sim P_{th}$ is proved?***Self-pumping***What occurs if a fuse is pumped at $\gg P_{th}$?*

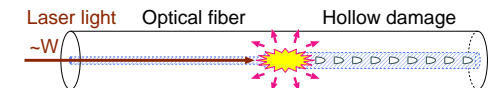
Slide 10

Today's talk

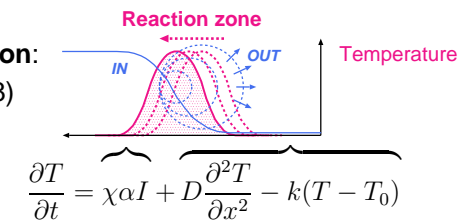
—3% with white tight-buffer

**Why P_{th} depends on fiber coatings?**

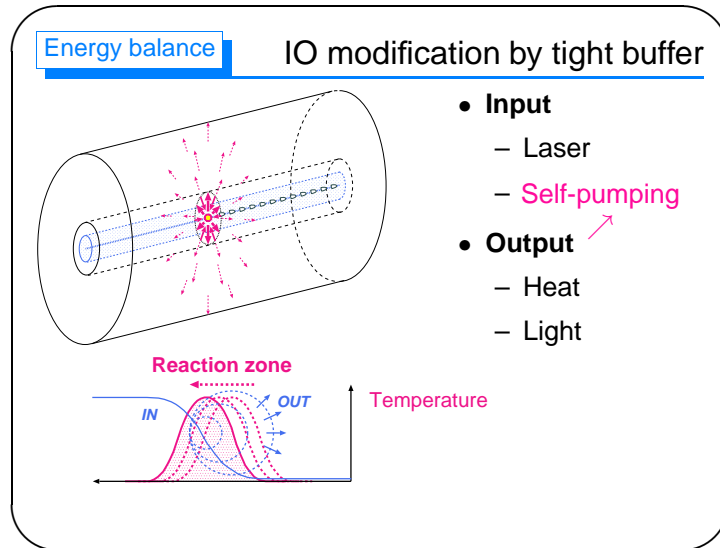
Slide 9

Energy balance**Dissipative soliton:**

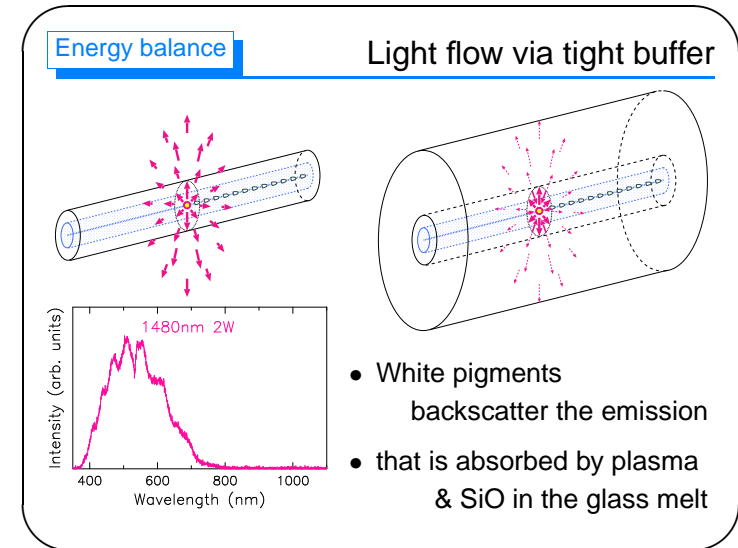
Akhmediev ('08)

*How this energy flow is modified by a tight buffer?*

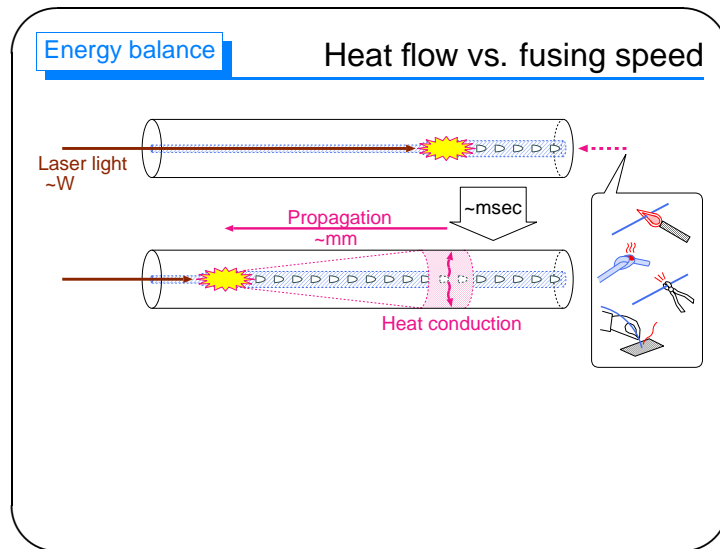
Slide 11



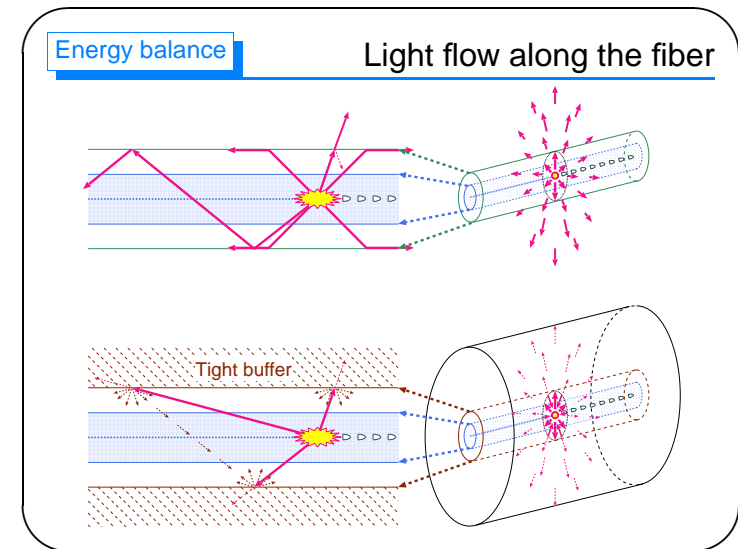
Slide 12



Slide 14



Slide 13



Slide 15

OVERVIEW

Partially self-pumped fiber fuse propagation

Energy balance

Back-scattered visible emission possibly pumps a fuse.

Evidence

How this mechanism at $\sim P_{th}$ is proved?

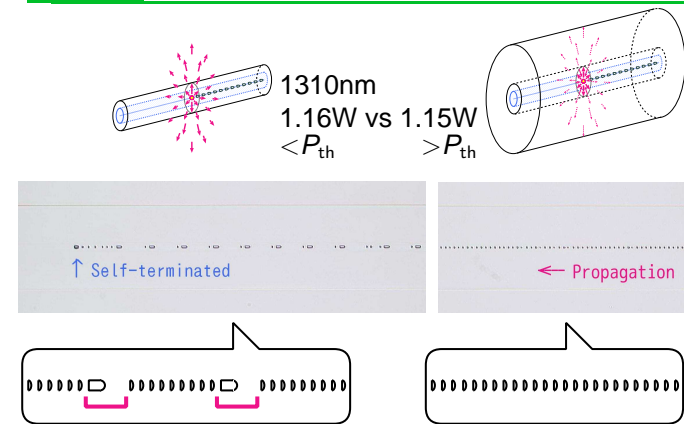
Self-pumping

What occurs if a fuse is pumped at $\gg P_{th}$?

Slide 16

Evidence

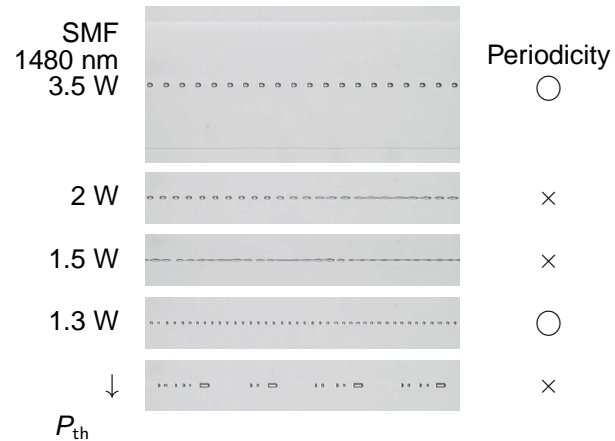
Void train left in damaged fibers



Slide 18

Evidence

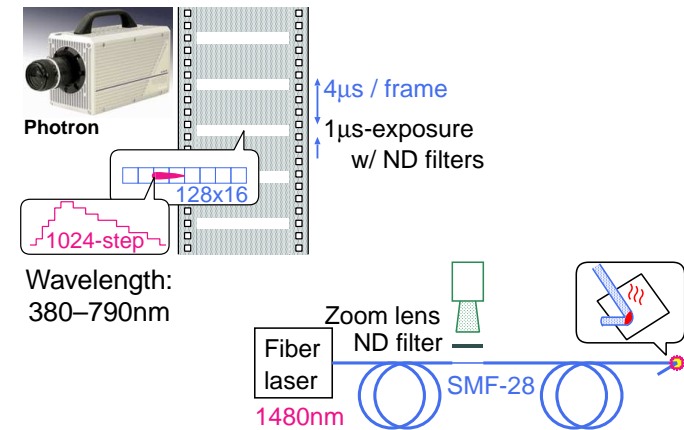
Void interval vs. Power ($\sim P_{th}$)



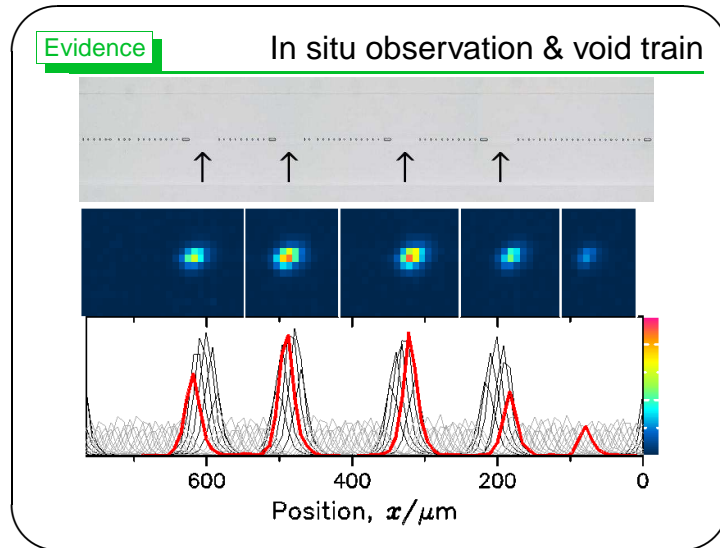
Slide 17

Evidence

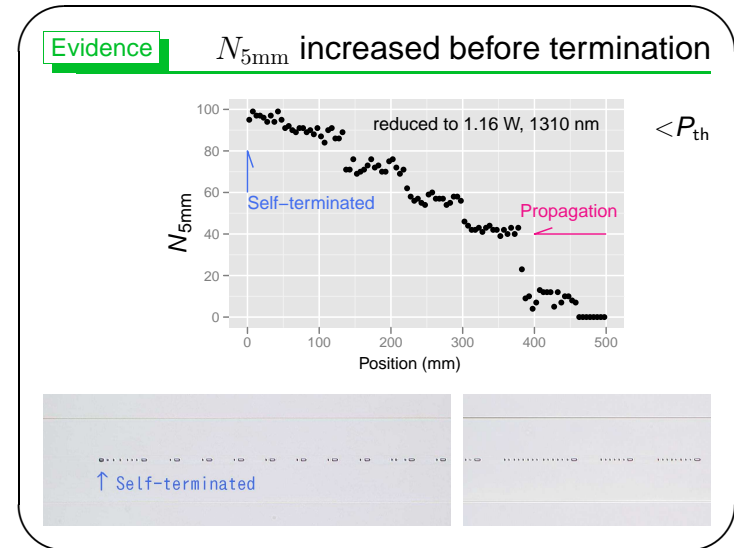
Ultra-high speed videography



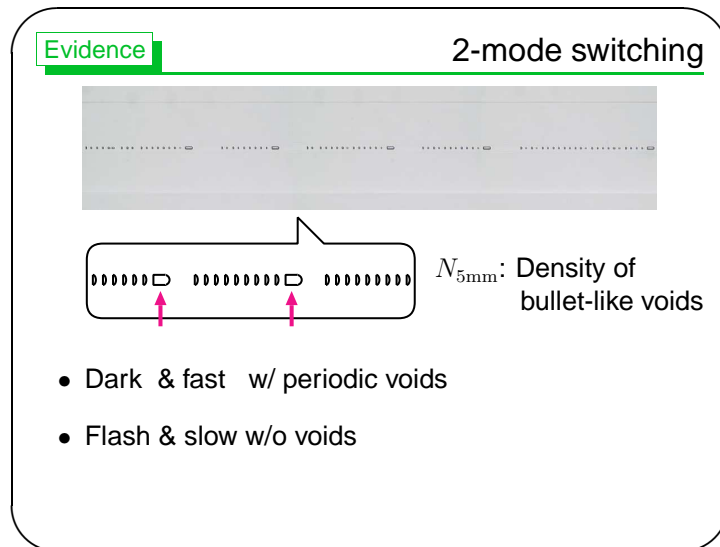
Slide 19



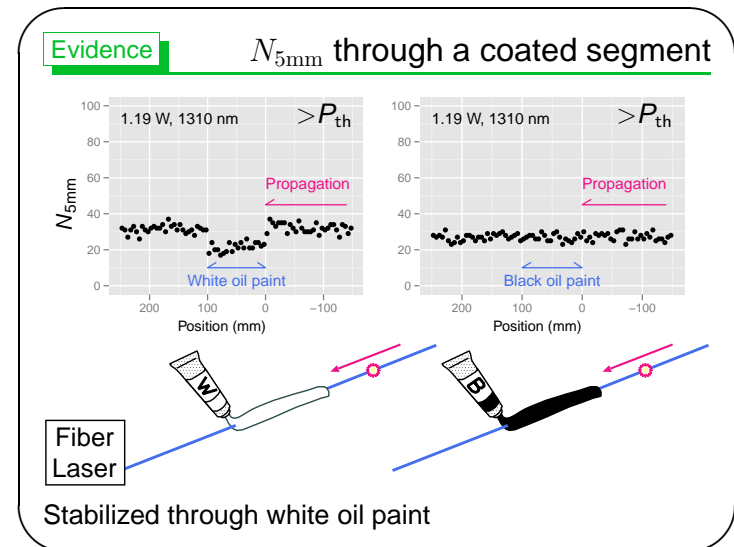
Slide 20



Slide 22



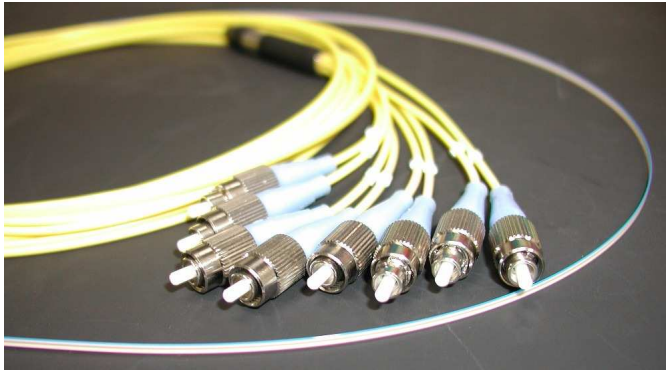
Slide 21



Slide 23

Evidence

White protective layers everywhere

Ribbon cables, Ceramic (ZrO_2) ferrules, etc.

Slide 24

Self-pumpingVoid interval vs. Power ($\gg P_{th}$)

9 W



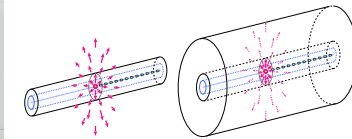
7 W



5 W



3.5 W



No apparent difference

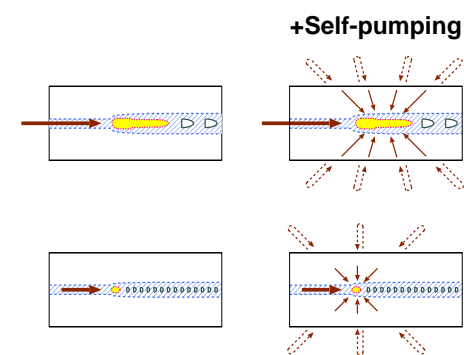
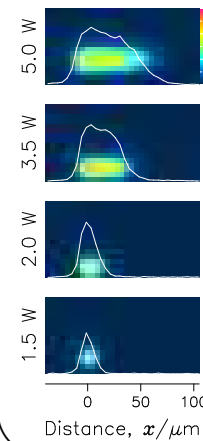
Slide 26

OVERVIEW

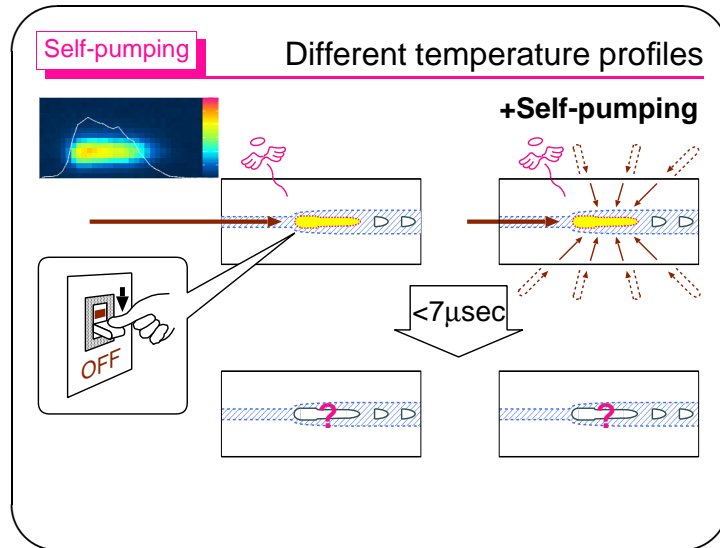
Partially self-pumped fiber fuse propagation

Energy balance*Back-scattered visible emission possibly pumps a fuse.***Evidence***A self-pumped fuse leaves a stabilized void pattern.***Self-pumping***What occurs if a fuse is pumped at $\gg P_{th}$?*

Slide 25

Self-pumpingPlasma shape vs. Power ($\gg P_{th}$)

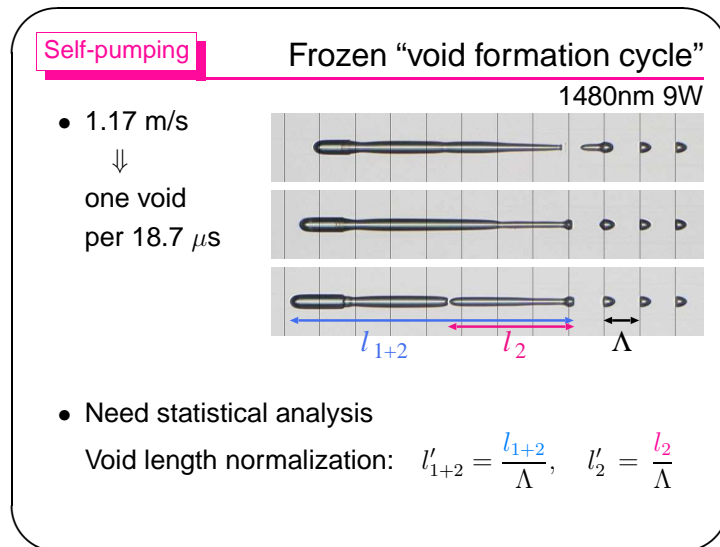
Slide 27



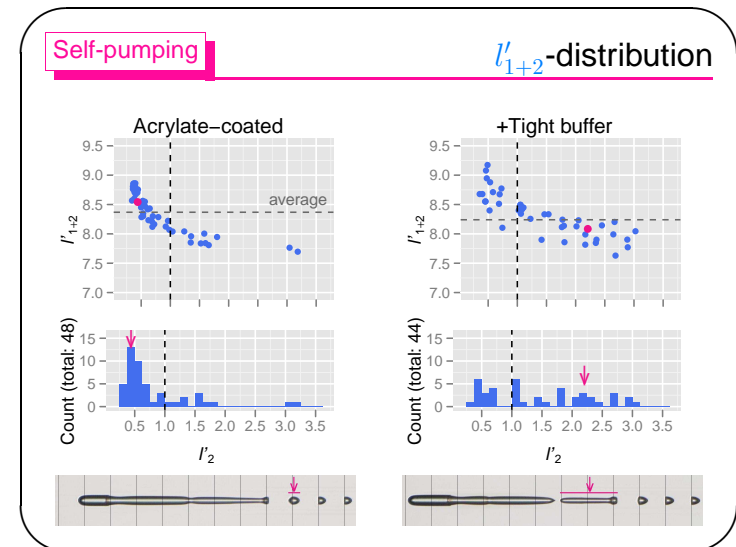
Slide 28



Slide 30



Slide 29

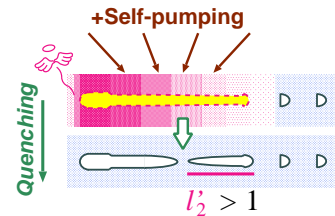


Slide 31

Self-pumping makes quenching time longer ...

- and promotes void separation

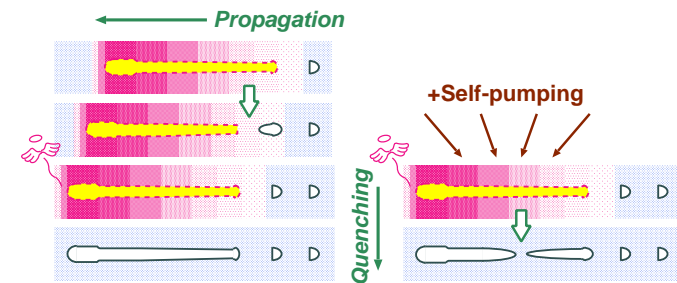
||
bridge formation



- A bridge appears only after the quench starts.

Slide 32

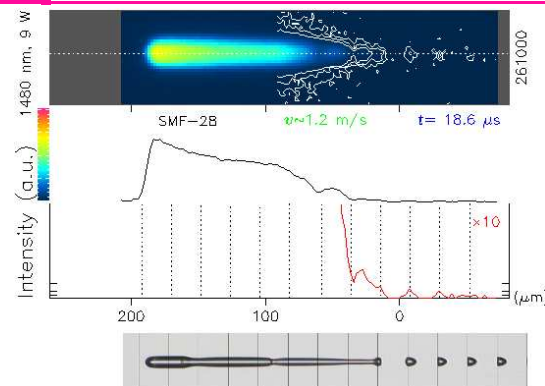
Self-pumping Quenching during propagation



- Bridge formation
← Melt incl. a cavity being quenched

Slide 34

Self-pumping No bridge in "in situ image"



- Quenching promotes bridge formation.

Slide 33

SUMMARY

Partially self-pumped fiber fuse propagation

Energy balance

Back-scattered visible emission possibly pumps a fuse.

Evidence

A self-pumped fuse leaves a stabilized void pattern.

Self-pumping

Longer quenching time promotes void separation.

Fiber coatings promote self-pumping: $P_{th} \searrow$

Slide 35