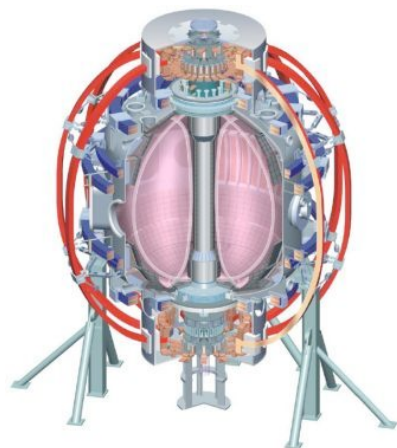


Dependence of energy confinement enhancement on lithium coating thickness

College W&M
Colorado Sch Mines
Columbia U
Comp-X
General Atomics
INEL
Johns Hopkins U
LANL
LLNL
Lodestar
MIT
Nova Photonics
New York U
Old Dominion U
ORNL
PPPL
PSI
Princeton U
Purdue U
SNL
Think Tank, Inc.
UC Davis
UC Irvine
UCLA
UCSD
U Colorado
U Maryland
U Rochester
U Washington
U Wisconsin

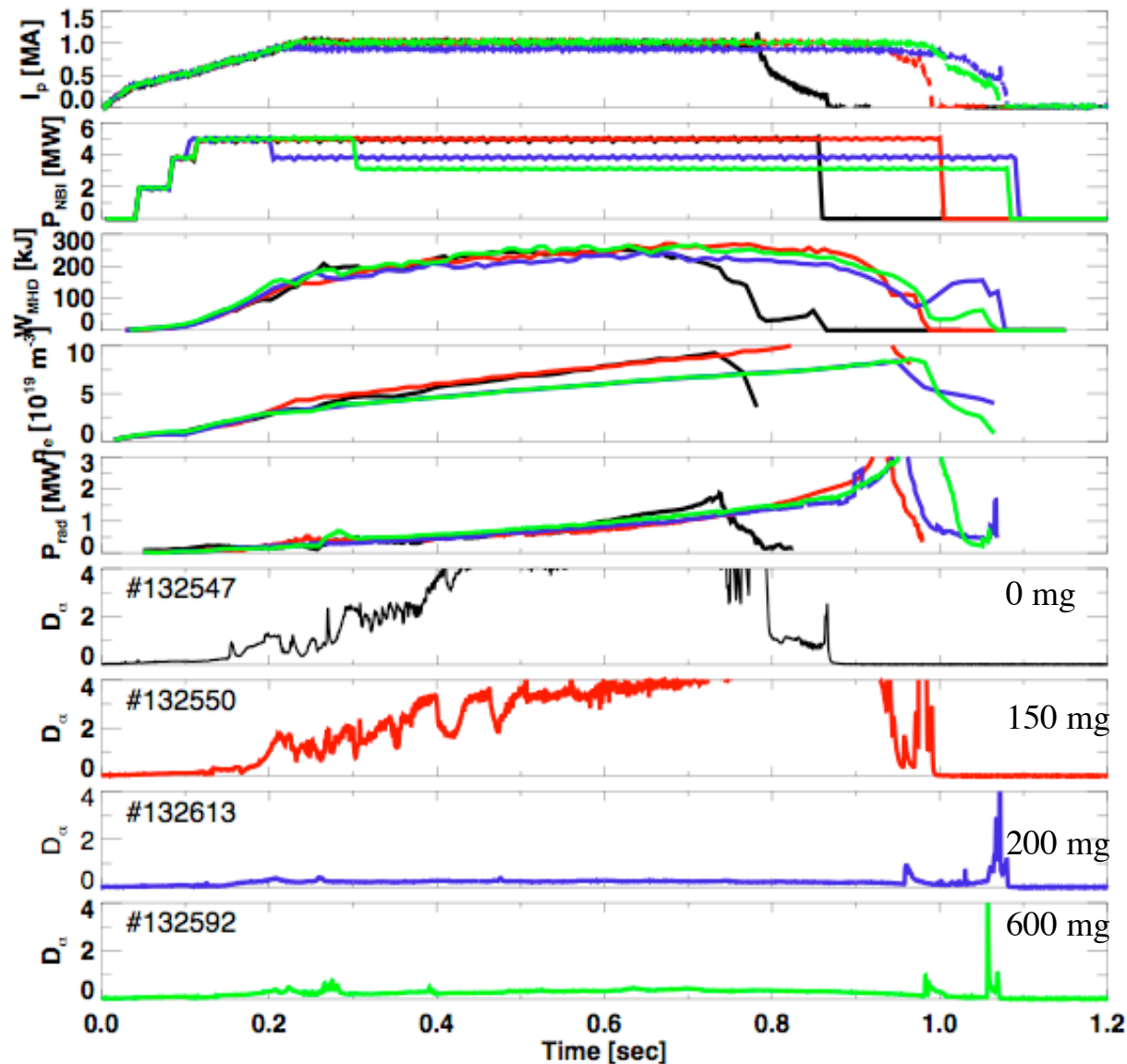
J.M. Canik and R. Maingi, ORNL

**NSTX Li Research TSG XP Review
Princeton, NJ
May 29, 2009**



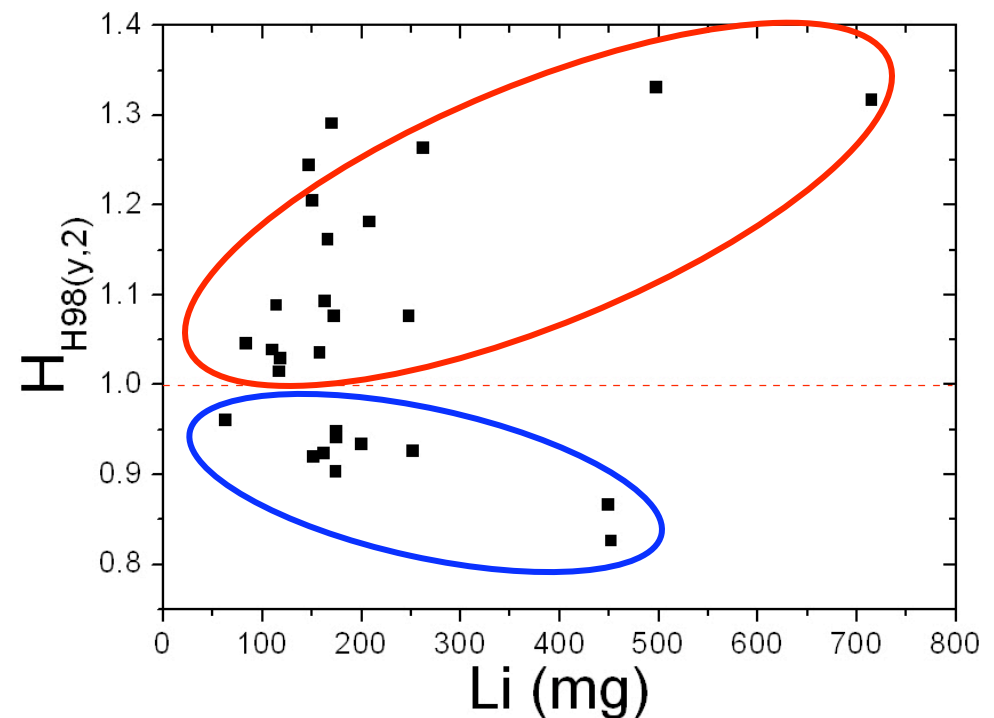
Culham Sci Ctr
U St. Andrews
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Chubu U
Fukui U
Hiroshima U
Hyogo U
Kyoto U
Kyushu U
Kyushu Tokai U
NIFS
Niigata U
U Tokyo
JAEA
Hebrew U
Ioffe Inst
RRC Kurchatov Inst
TRINITY
KBSI
KAIST
POSTECH
ASIPP
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep
U Quebec

Plasma confinement seems to increase with deposited Lithium (but...)



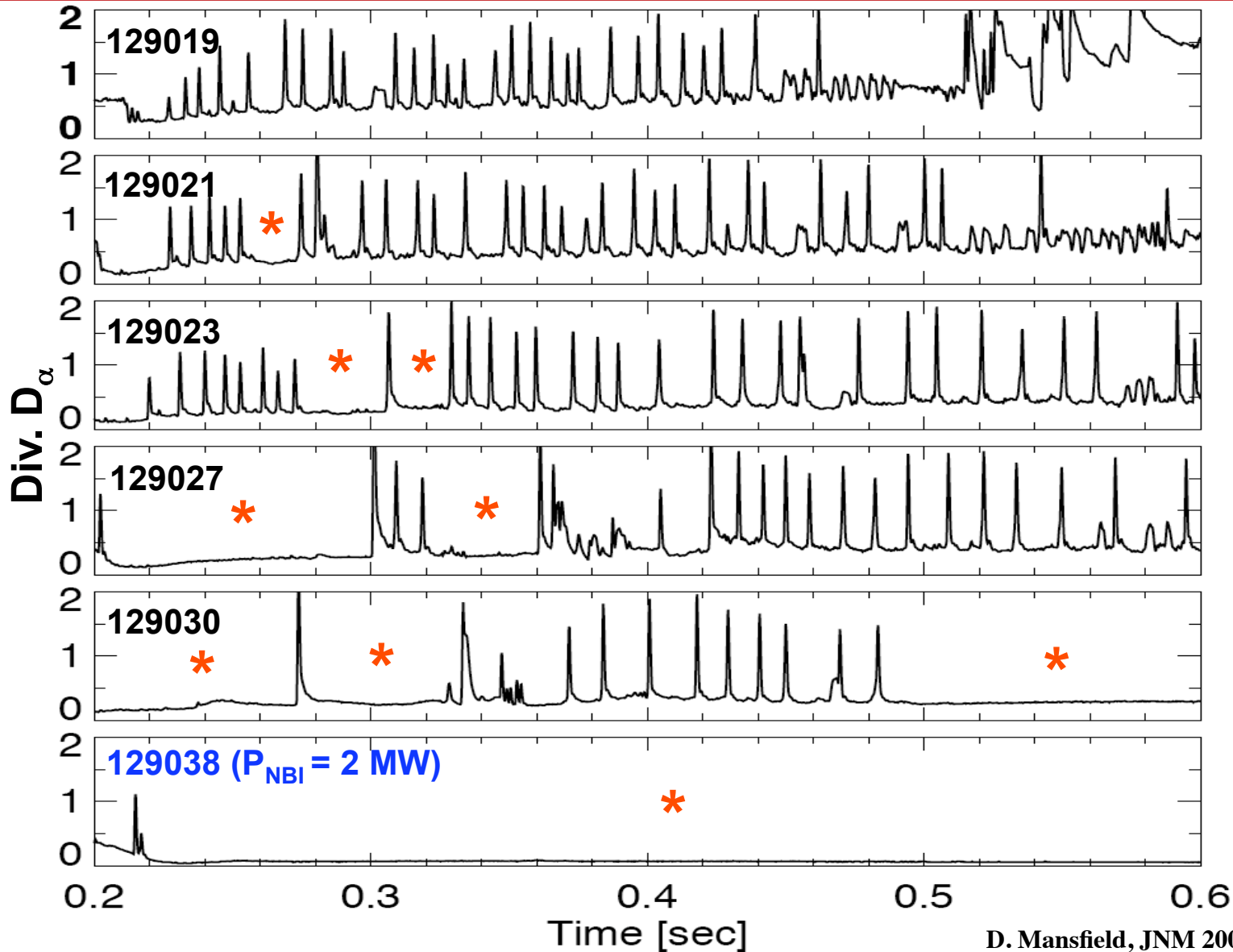
Some evidence for the enhancement of energy confinement increases with the Li layer thickness

- Transport has been analyzed for many shots by S. Ding
- Some of the data shows an increase in the H-factor at very high Li evaporation
 - ...but some data shows the opposite trend
- These shots are from many days
 - Need a controlled experiment to conclusively test this



Ding, NSTX physics mtg 5/4/09

Li layer thickness clearly affects the ELM behavior



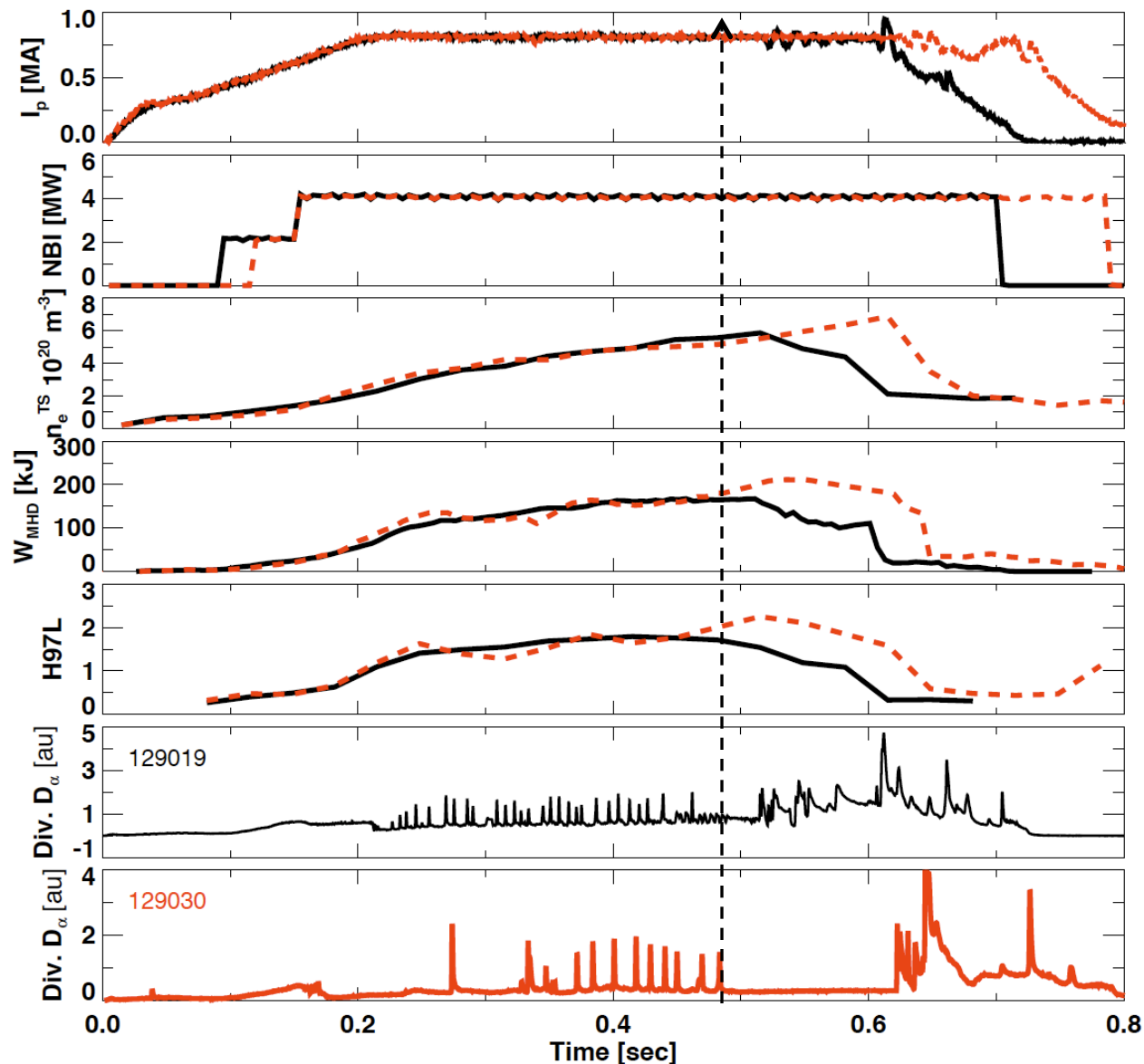
No lithium

Increasing
lithium
coating



D. Mansfield, JNM 2009

Stored energy increased after ELMs disappeared



Maingi, TTF 2009

No lithium
With lithium

• Does stored energy continue to increase with Li beyond what is required to suppress ELMs?

Proposed ½ day shot list



- Start with standard fiducial
- Vary amount of Li evaporated between shots
 - 0, 100, 200, 300, 400 and 500 mg/shot
 - Take three shots at each level
 - If confinement is improving with evaporation, extend to 600 mg
- 18-21 shots required, can do in solid ½ day
 - Planning for 10 minute shot cycle, requires high evaporation rate towards the end of the shot list
- Possible modifications for group discussion
 - Add in a shot of RMP ELM triggering (at 50 or 60 Hz) at each Li level to test ELM size vs. Li layer thickness?
 - Would start with different shot: 800 kA, $\kappa \sim 2.5$, $|drsep| < 5$ mm
 - Add a series of shots in L-mode to separate confinement enhancement and ELM suppression?