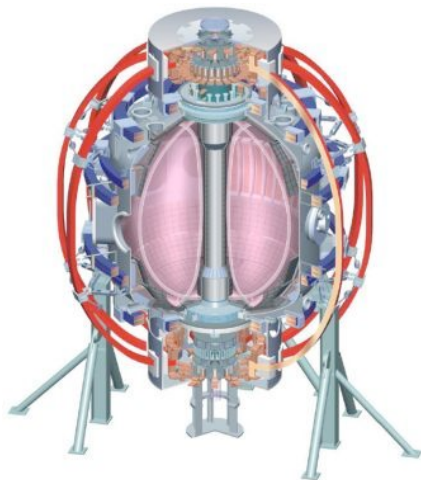


Preliminary 2010 Fueling Characteristics with LLD

H. W. Kugel, M. G. Bell

LRTSG, B-318
Aug. 23, 2010

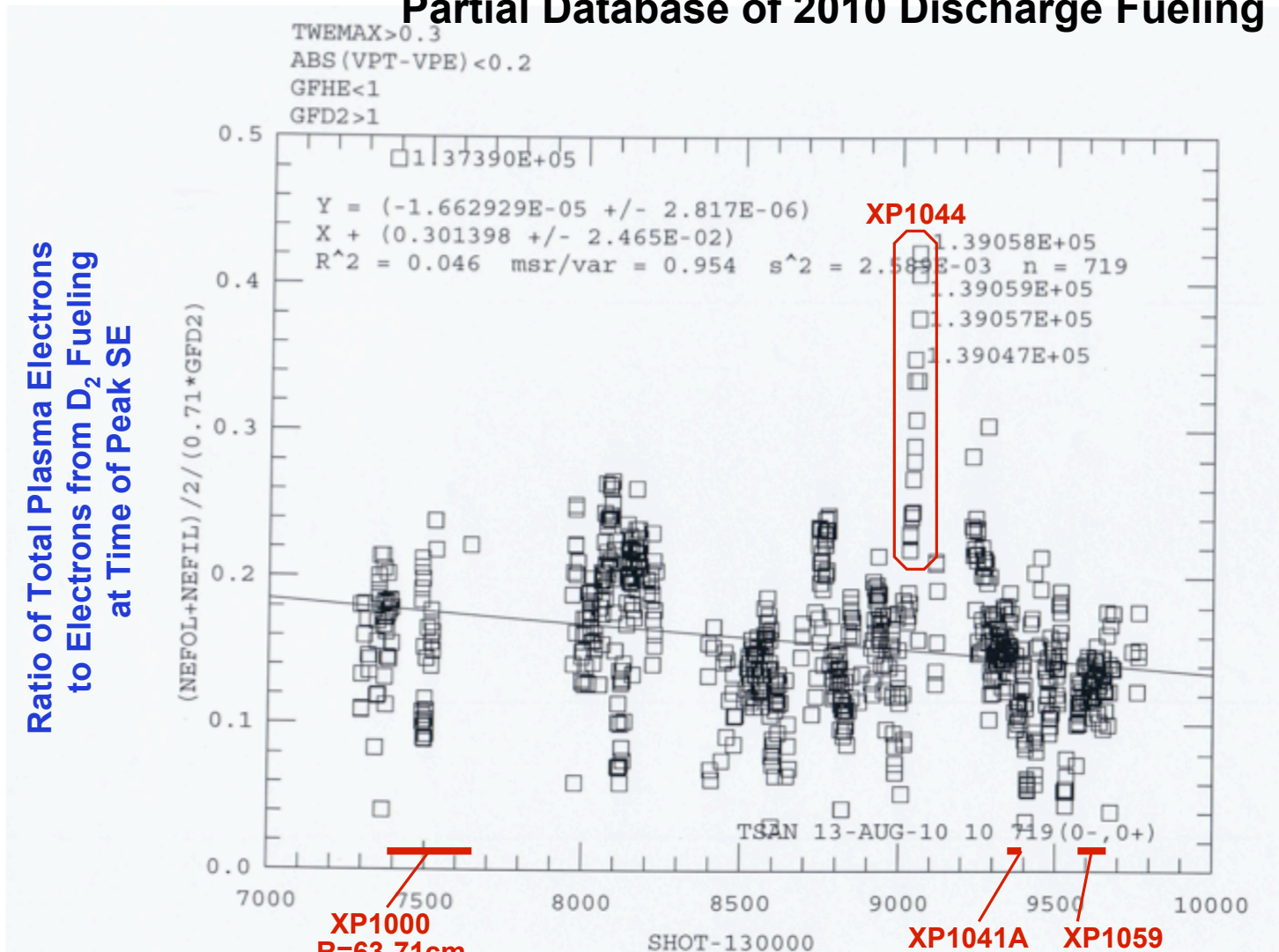
College W&M
Colorado Sch Mines
Columbia U
CompX
General Atomics
INEL
Johns Hopkins U
LANL
LLNL
Lodestar
MIT
Nova Photonics
New York U
Old Dominion U
ORNL
PPPL
PSI
Princeton U
Purdue U
SNL
Think Tank, Inc.
UC Davis
UC Irvine
UCLA
UCSD
U Colorado
U Illinois
U Maryland
U Rochester
U Washington
U Wisconsin



Culham Sci Ctr
U St. Andrews
York U
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
TRINITI
KBSI
KAIST
POSTECH
ASIPP
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep
U Quebec

**PRELIMINARY- Required Fueling with LLD Warm or Cold With OSP
On or Off LLD is Comparable to 2008-2009 Solid Li Coatings on ATJ**

Partial Database of 2010 Discharge Fueling

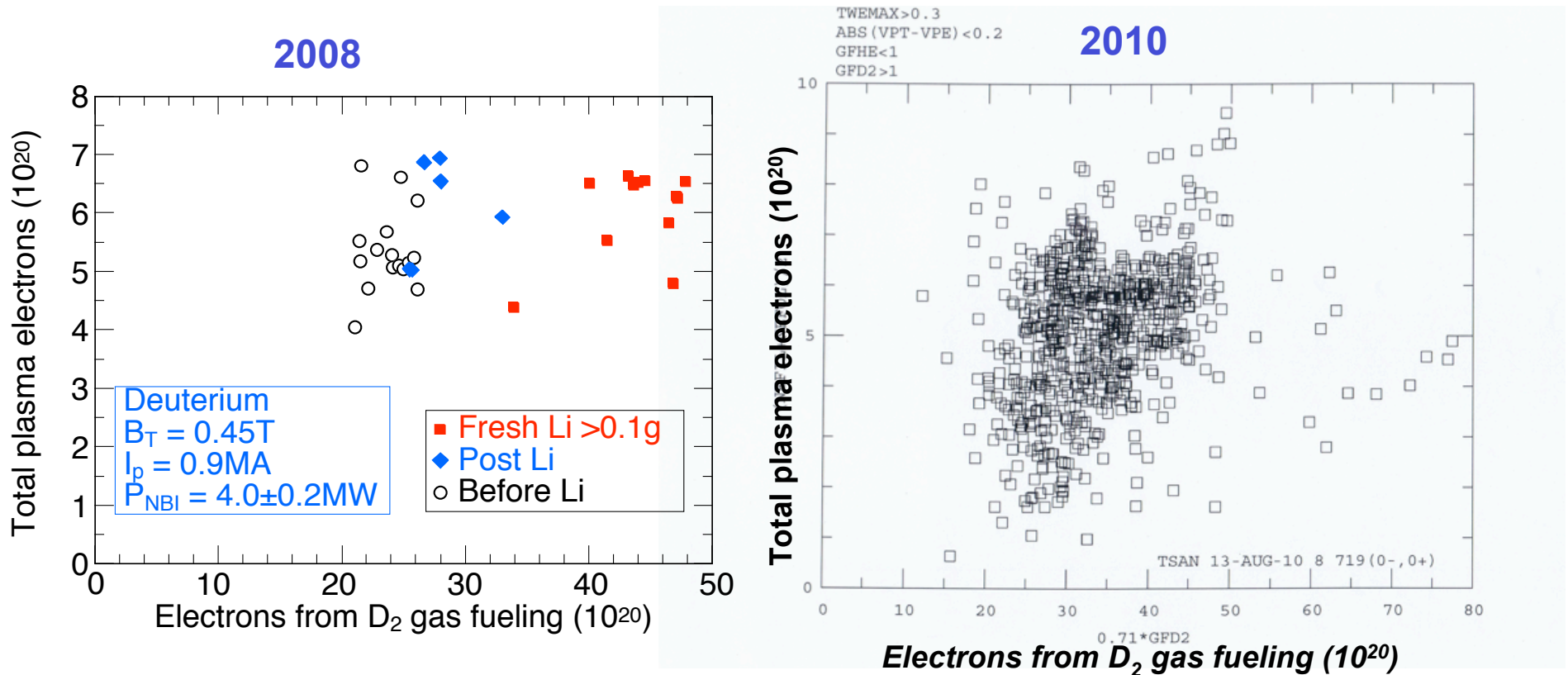


- XP1000
137385--623
- XP1041A
139376-414
- XP1059
139570-642

Shot Number -130000

**M.G. Bell
Preliminary**

PRELIMINARY- Required Fueling with LLD Warm or Cold With OSP On or Off LLD Similar to that for 2008 Solid Li Coatings on Graphite



M.G. Bell
 PSI2008

M.G. Bell
 Preliminary

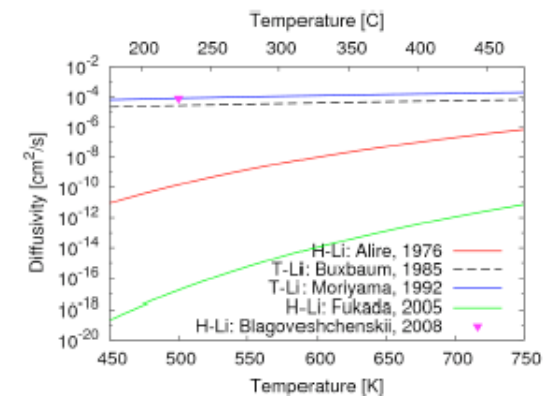
Conditions Determining the LLD Pumping Rate

- **Conditions for LLD low recycling**

- 1) Total incident D must be less than total available Li atoms
 - Li coating thickness over the complex contours of the Mo porosity needs to exceed the D range over PFC regions
- 2) Rate at which D diffuses from Li surface into the bulk must exceed the incident flux.
 - the Li coating thickness over the complex contours of the Mo porosity contours needs to allow sufficient diffusion from Li surface
- 3) Incident D must react chemically with available Li and be bound.
 - impurity complexes on LLD surface might provide only pumping comparable to that of similar impurity complexes on solid coatings on ATJ

- **Effects that prevent LLD low recycling:**

- 1) Plasma interacts with the surface of the LLD only, not with the bulk and saturates surface.
- 2) Low D diffusion from surface (reported diffusivity of H in Li differ by 6-15 orders of magnitude.
- 3) Surface coverage and bulk accumulation of impurities.



M. Jaworski, LRTSG, 4/14/2010