



NSTX

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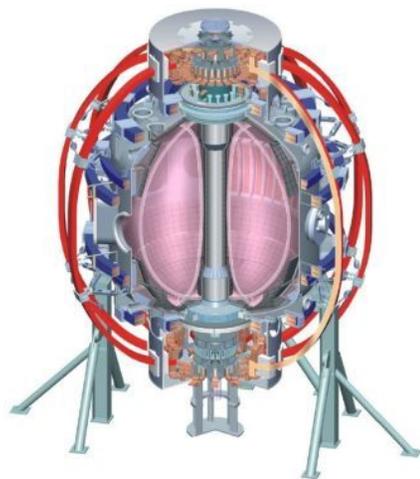
# Status of LLD Cleanup, Molybdenum Tile Design, Liquid Lithium Fill System Testing

H. W. Kugel

Lithium Research Topical Science Group Meeting  
Dec. 07, 2010

College W&M  
 Colorado Sch Mines  
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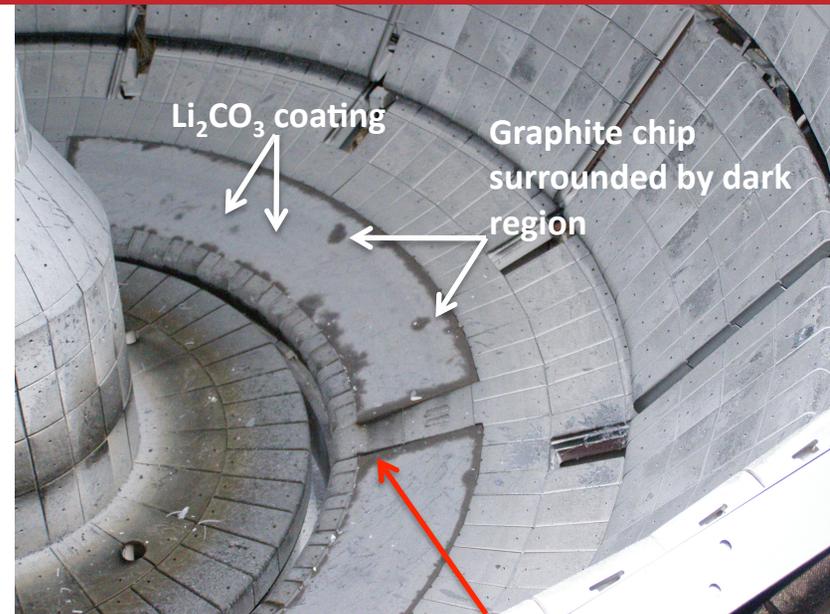
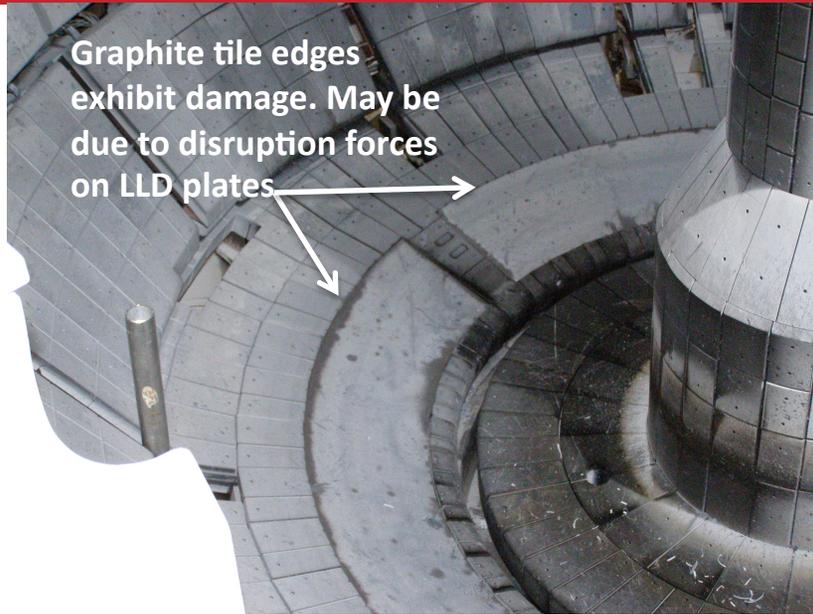
Culham Sci Ctr  
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 RRC Kurchatov Inst  
 TRINITY  
 KBSI  
 KAIST  
 POSTECH  
 ASIPP  
 ENEA, Frascati  
 CEA, Cadarache  
 IPP, Jülich  
 IPP, Garching  
 ASCR, Czech Rep  
 U Quebec



# Photo of NSTX Interior Following 1.347 kg Lithium Deposition Applied During 2010 Experimental Campaign Indicates Extensive Lithium Coverage Due to Direct Evaporation and Plasma Transport

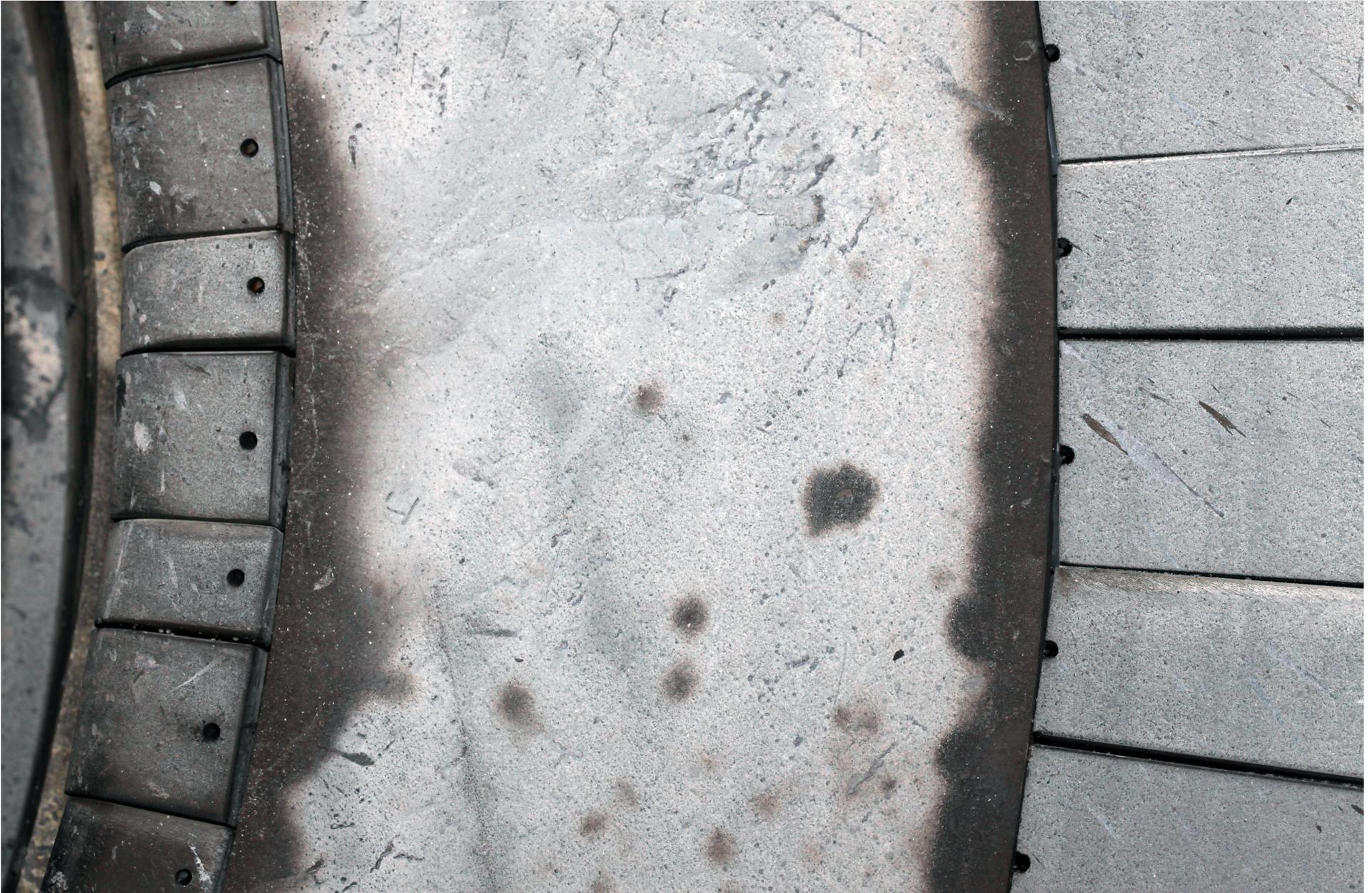


# LLD Awaiting Cleanup and Maintenance Assessment

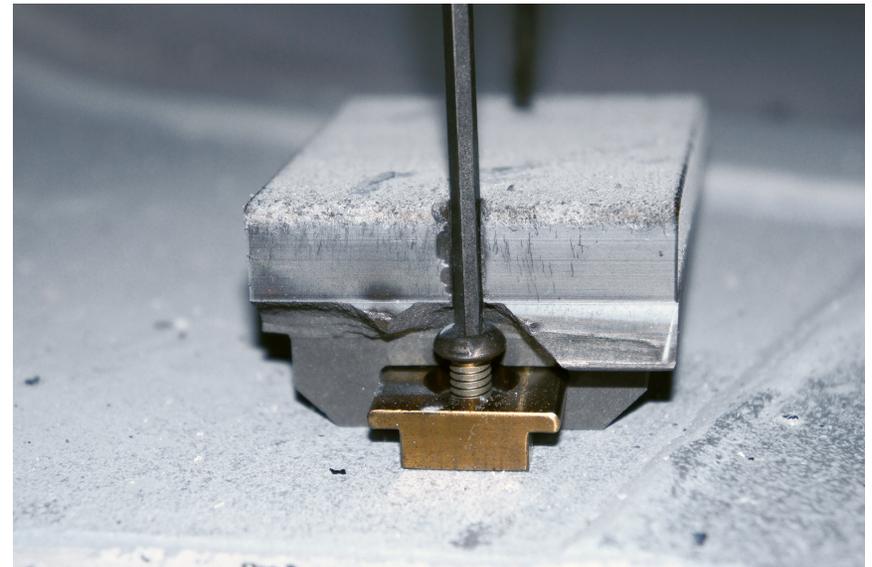


- Dark features along most LLD edges awaiting testing:
  - sputtered graphite, or
  - Li-copper eutectic oxidized into  $\text{CuO}$  (black); do copper test

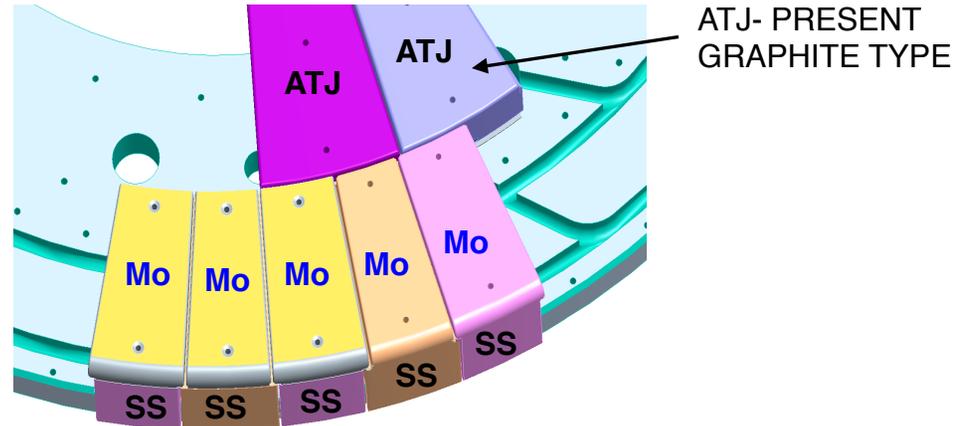
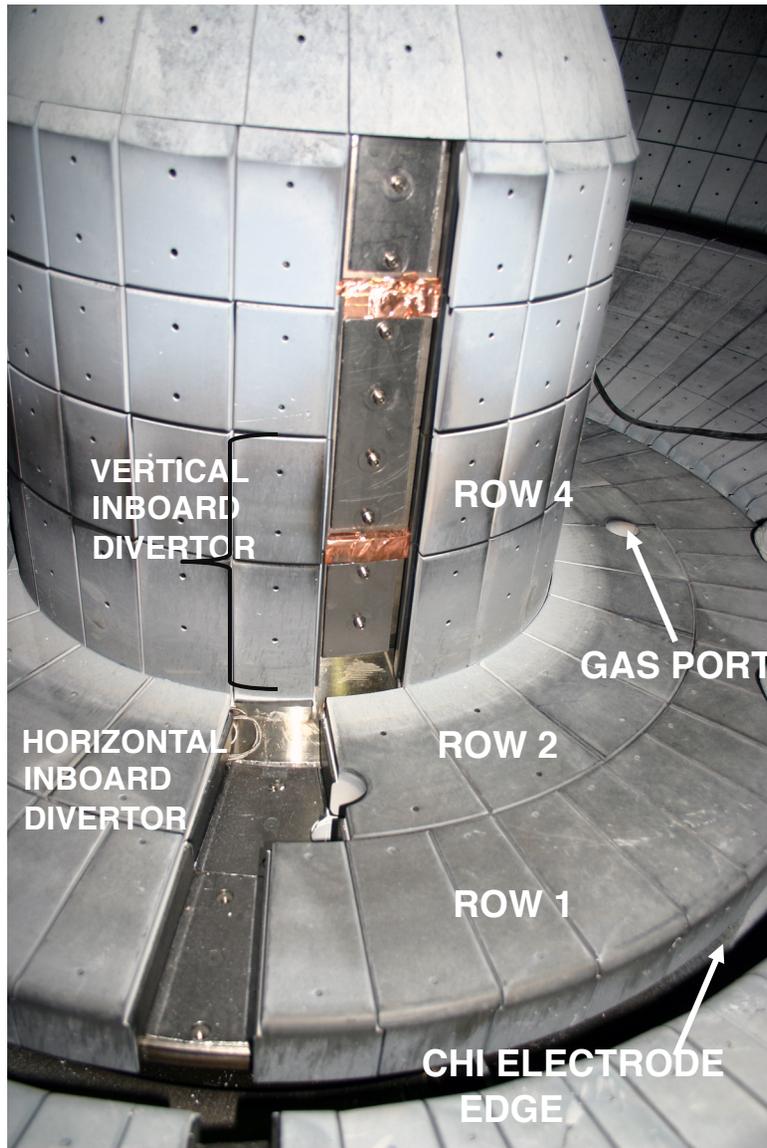
## LLD Plate and Edge Graphite Tiles After 2010 Campaign Using 1.347 Kg Li Deposition



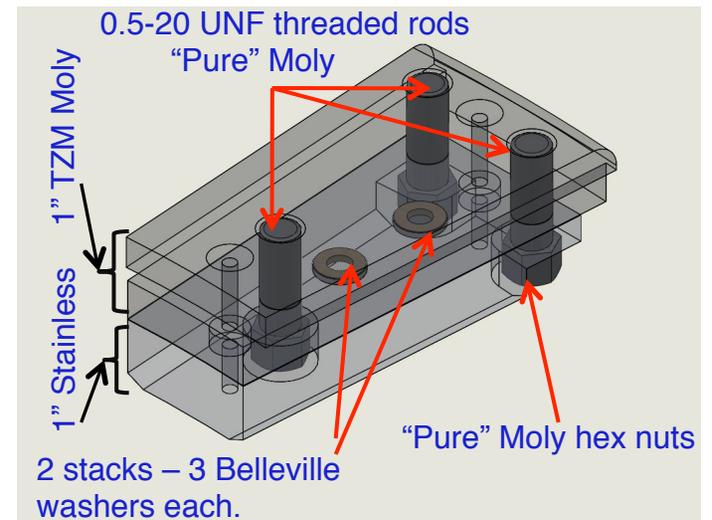
## Typical Features of LLD Plate and Edge Graphite Tiles After 2010 Campaign Using 1.347 Kg Li Deposition



# Engineering in Progress to Provide Inner Divertor Row-1 with Molybdenum Plasma Facing Surface

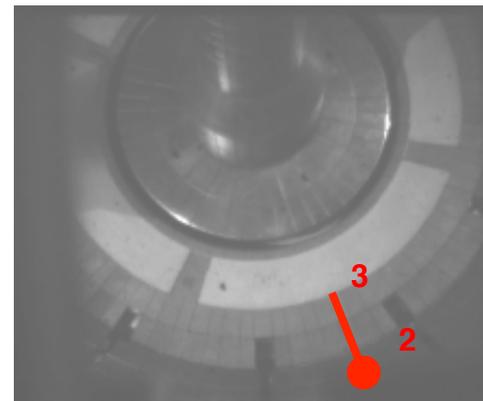
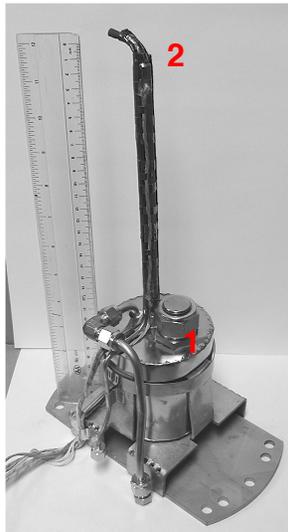


- Simulations using disruption data indicate that the disruption induced turning-forces on a Moly tile are large, and that the graphite is not sufficiently strong to hold a Moly tile bolted to its Tee-bar, or directly to the graphite block without shattering



# Testing of More Efficient LLD Loading with Liquid Lithium Fill System in Progress

- Proposed concept adopts LITER Liquid Lithium Fill system (LIFTER) technology being used to refill LITERS
- Concept
  - 1 station per plate (one per 90°)
  - 3 components per fill station:
    1. External LIFTER-like unit (similar to LITER liquid Li fill system)
    2. Heated vertical pipe from port to distribution pipe near outer wall
    3. Moly or ATJ clad 316-SS pipe from distribution pipe to plate



*J. Timberlake*

# Testing Candidate Liquid Lithium Fill System in Progress

## Laboratory Test Set-Up

