NSTX

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

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POSTECH
ASIPP
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep
U Quebec

Lithium Research Topical Science Group Meeting
Dec. 07, 2010

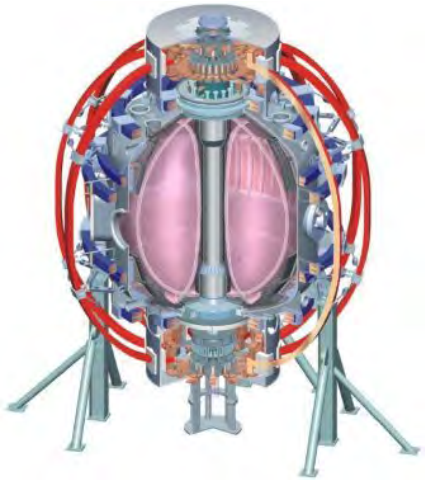
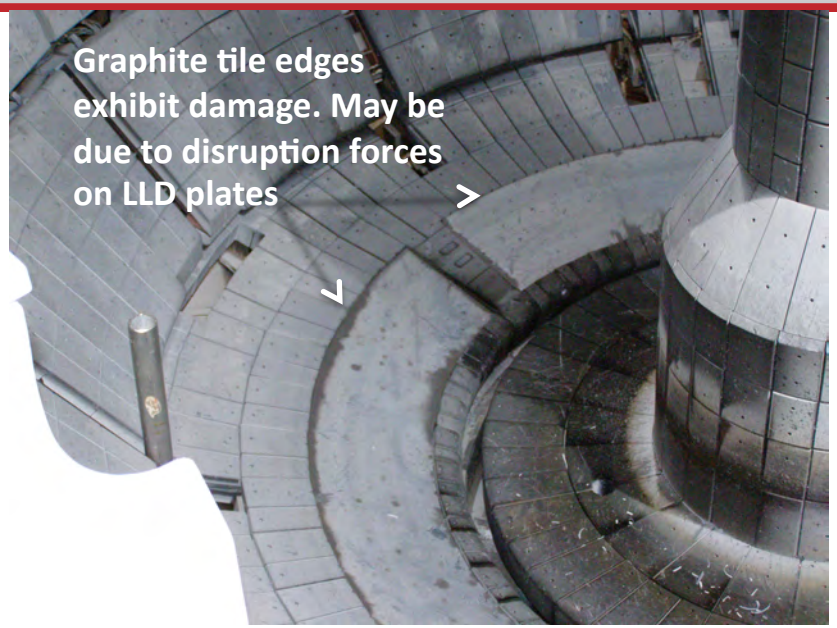
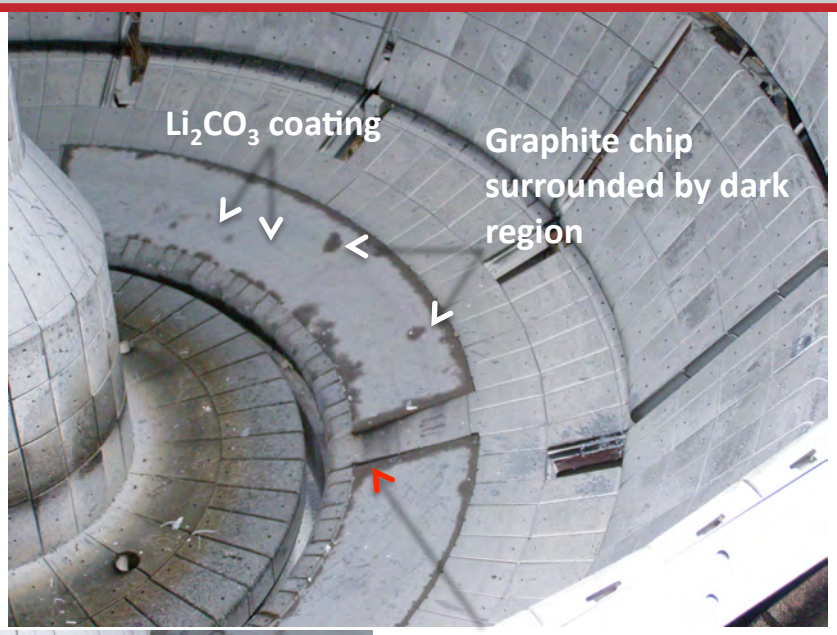
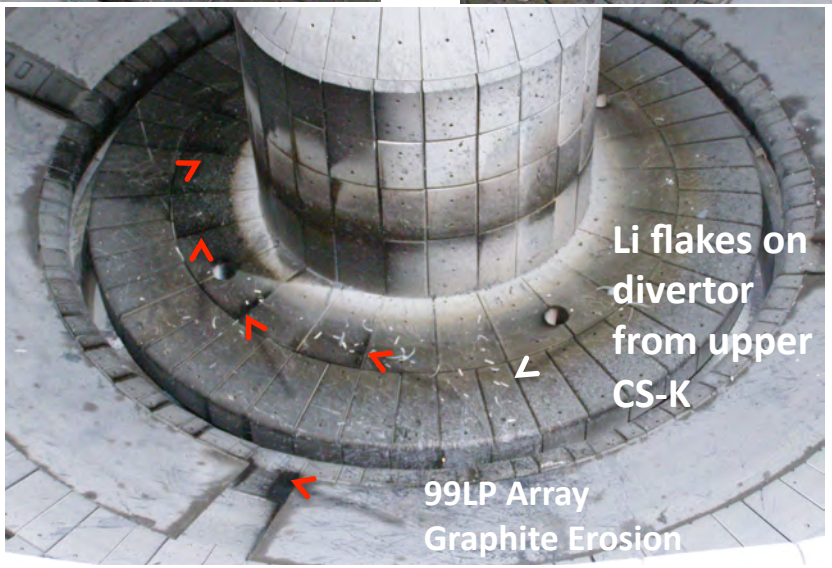


Photo of NSTX Interior Following 1.347 kg Lithium Deposition Applied During 2010 Experimental Campaign Indicates Extensive Lithium Coverage Due to Direct Evaporation and Plasma Transport

LLD Awaiting Cleanup and Maintenance Assessment



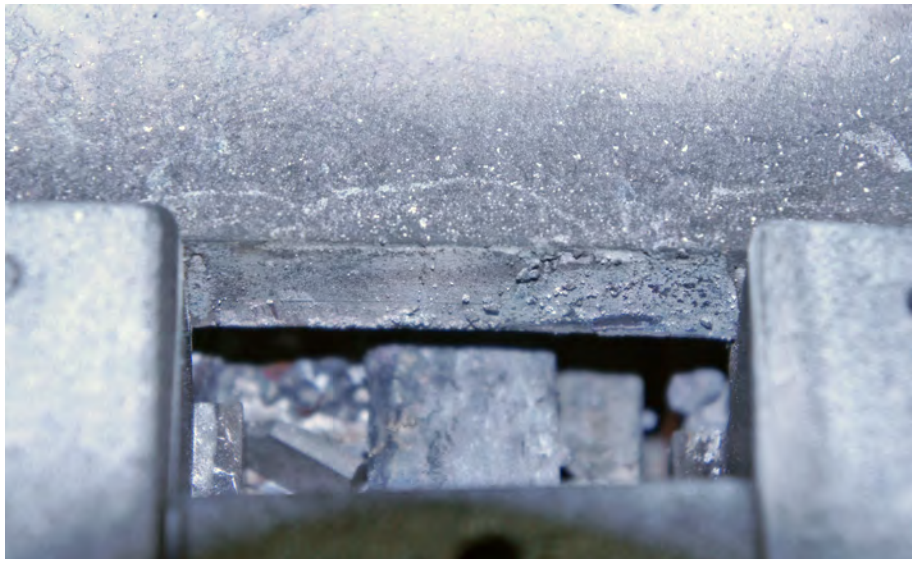


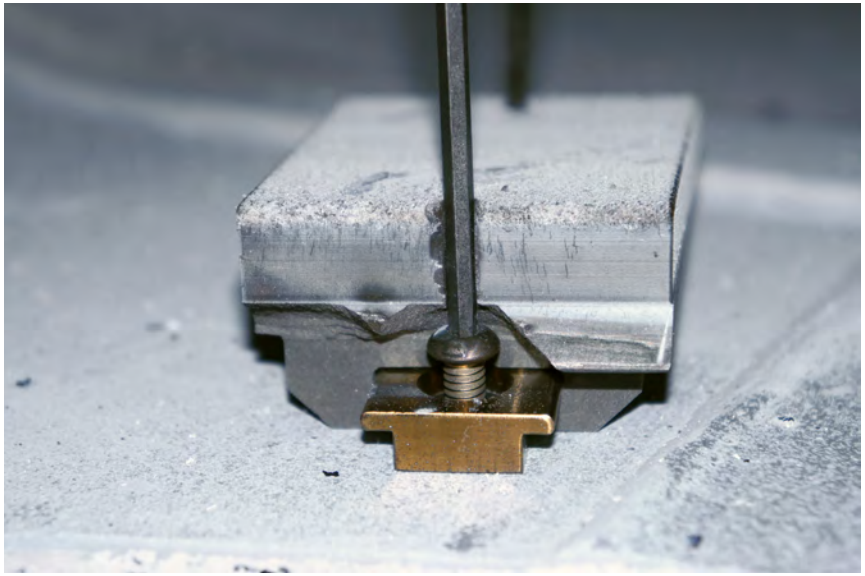


- Dark features along most LLD edges awaiting testing:
  - sputtered graphite, or
  - Li-copper eutectic oxidzied into CuO (black); do copper test

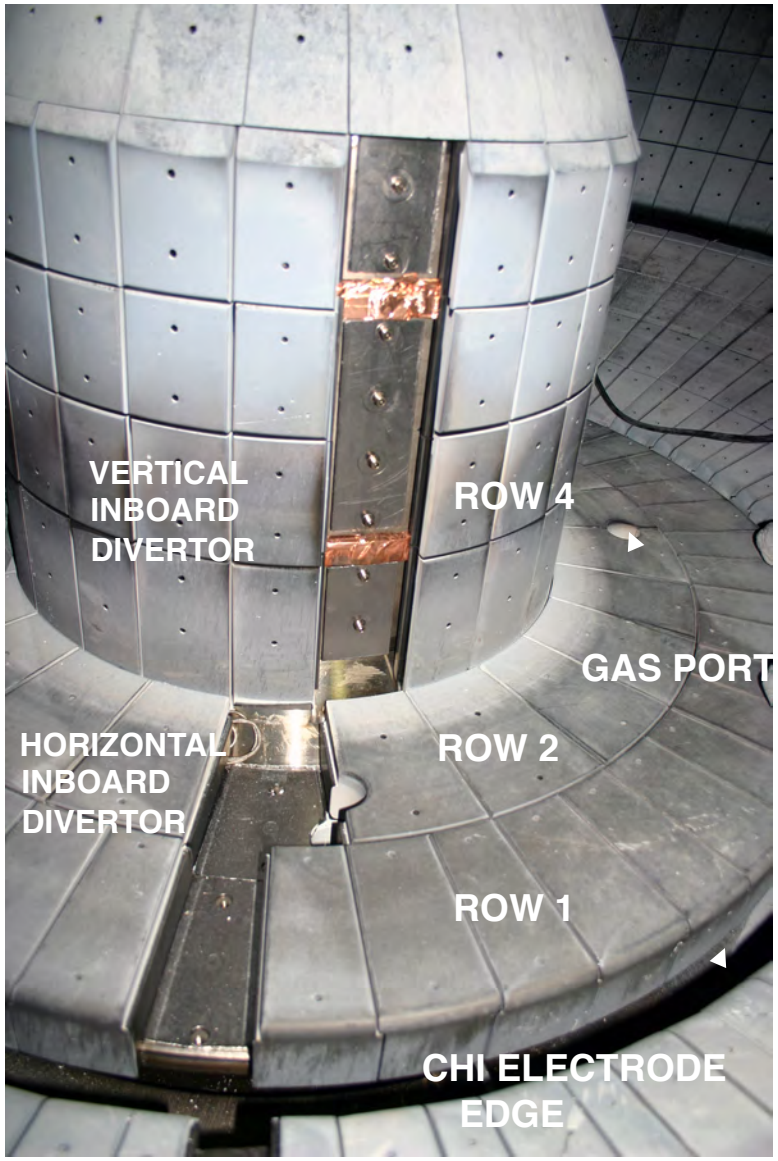
LLD Plate and Edge Graphite Tiles After 2010 Campaign Using 1.347 Kg Li Deposition

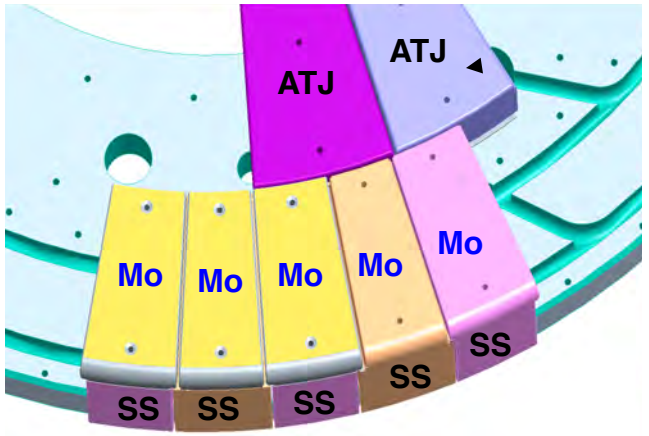
Typical Features of LLD Plate and Edge Graphite Tiles After 2010 Campaign Using 1.347 Kg Li Deposition





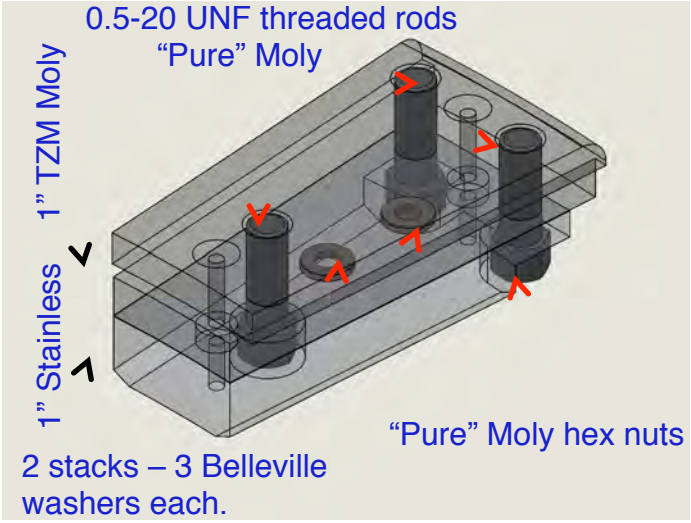
Engineering in Progress to Provide Inner Divertor Row-1 with Molybdenum Plasma Facing Surface





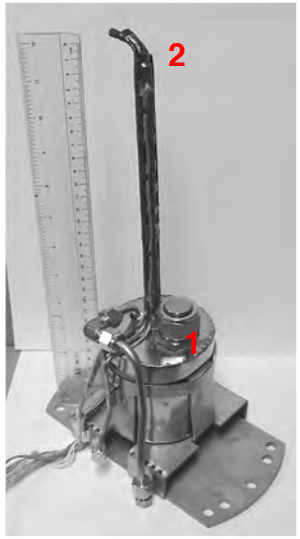
ATJ- PRESENT GRAPHITE TYPE

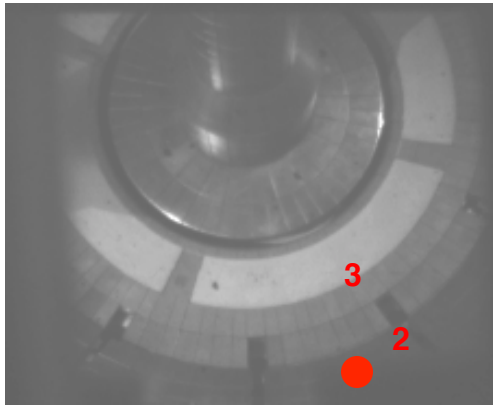
- Simulations using disruption data indicate that the disruption induced turning-forces on a Moly tile are large, and that the graphite is not sufficiently strong to hold a Moly tile bolted to its Tee-bar, or directly to the graphite block without shattering



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