

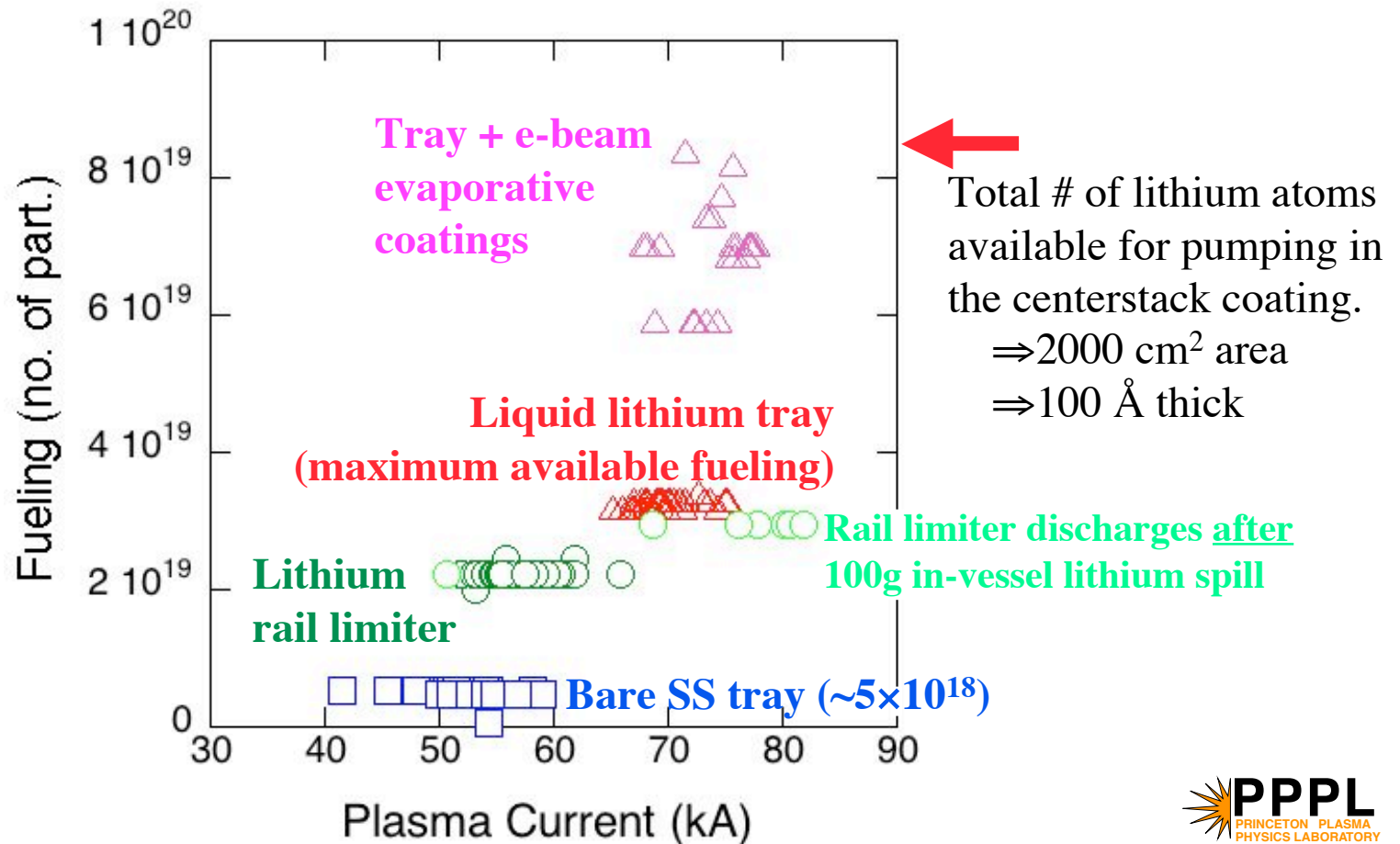
A very short summary of CDX-U lithium regimes



- ◆ A number of wall conditions were tested in CDX-U
 - Unconditioned stainless steel walls/limiters
 - Titanium gettering + lithium coatings
 - » Rail limiter experiment ($\sim 150 \text{ cm}^2$ exposed lithium)
 - 600 cm^2 liquid lithium limiter + intense solid lithium wall coatings
 - 2000 cm^2 liquid lithium limiter (50% PFC surface) + wall coatings
- ◆ Monitored effect of various wall conditions on
 - Fueling
 - External loop voltage
 - » Simple measure of plasma performance

Fueling requirements (including prefill)

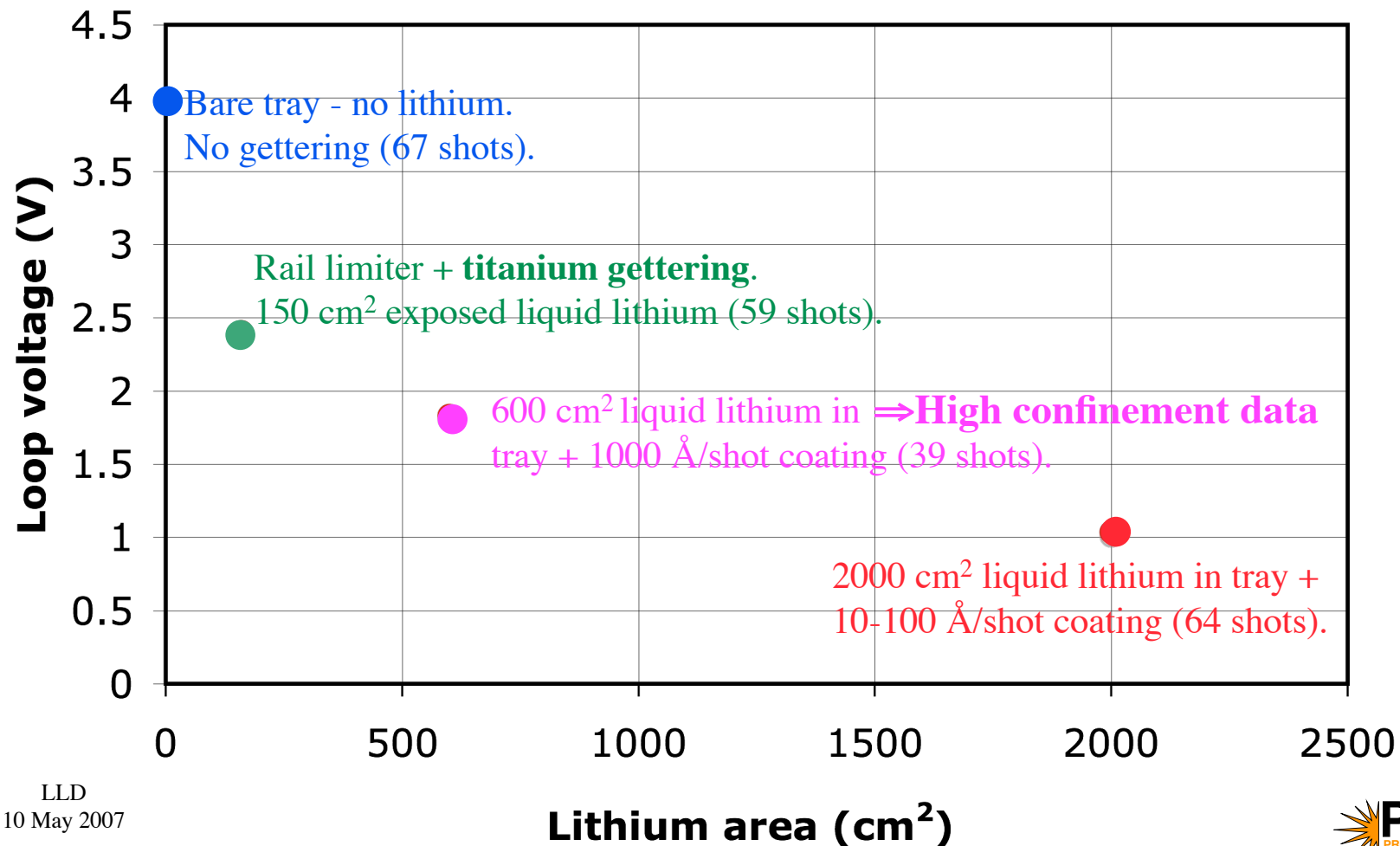
- ◆ Fueling requirements increased by more than an order of magnitude
- ◆ Rail limiter fueling requirements intermediate to bare/filled tray cases
 - But: fueling increased by 4-5 × with solid wall coatings. NSTX?
- ◆ New fueling systems added for e-beam run (puffing capability ~doubled)



Best performance with largest area of *liquid* lithium

- External loop voltage behavior is a qualitative indicator of performance
- Typically, total fueling exceeds capacity of solid lithium centerstack coating

Average loop voltage required for 2 MA/sec current ramp



Summary



- ◆ CDX-U experiments employed a rail limiter, a free-surface liquid lithium limiter, and wall coatings
- ◆ Larger liquid lithium area = better performance
 - 2000 cm² + modest coatings provides better performance than 600 cm² + rapid between-shots coatings
- ◆ But: rail limiter operations *still* allowed for a 5× increase in fueling
 - Primarily the effect of solid wall coatings
 - T11M, FTU results were also primarily due to wall coatings
 - Coating rates were low compared to recent NSTX operation
- ◆ *Why* is the particle control effect so small on NSTX?
 - Divertor?
 - Carbon wall?