

2009 Lithium Dropper Summary

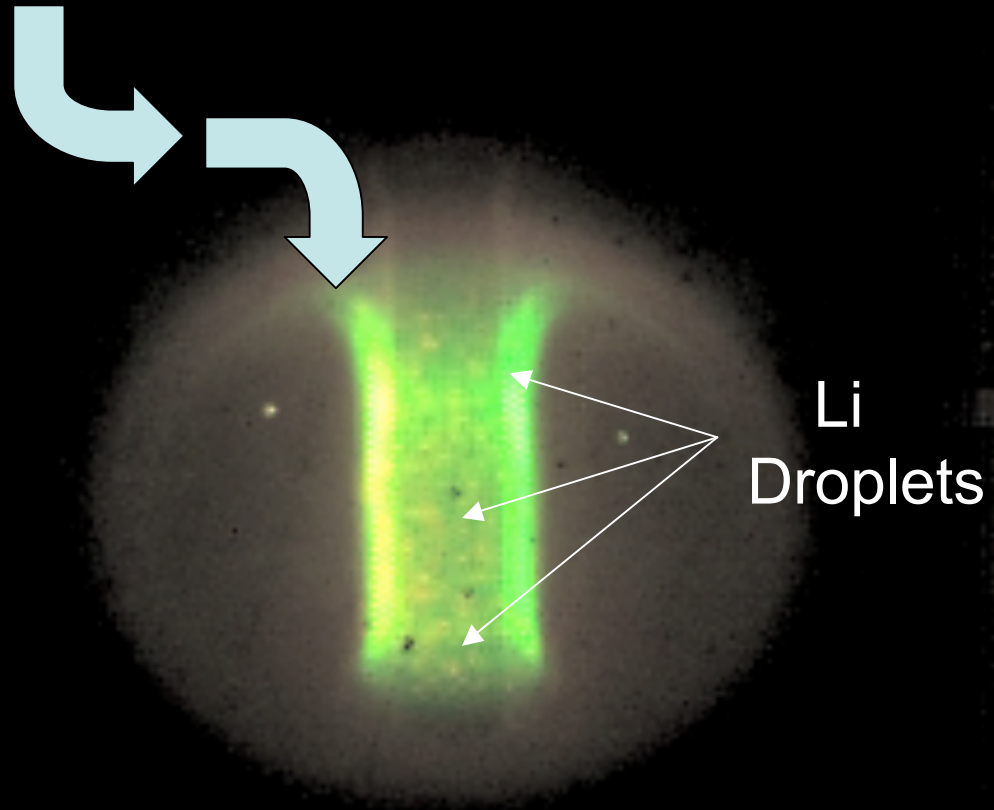
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2009 Lithium Dropper Summary

- Droppers worked reliably after initial problems delayed installation.
Each reloaded and/or replaced *in situ* – overnight.
- Delivered up to 150 mg/s - well tolerated by plasma.
- Bay C Li particles clearly reached the CS midplane at $t = 0$.
A surprise - probably due to poloidal electric field $t < 0$.
Could coat CS and reduce early OH consumption.
- During USN *both* Li ions and droplets spiraled *up* to strike point.
Hence Li injected *below* midplane would spiral *down* to strike point in LSN
Could resupply the LLD or perhaps influence 5 second shots.
- Glow-free operation continued for $\frac{1}{2}$ day using dropper(s) only when LITER removed.
Some shots performed well but operation with low CS gas (XP-913) did not succeed.
- Inherited poor conditions after no-LITER RF run. Difficult day, but $D\alpha$ finally decreased & shot length increased when Li “dumped” onto divertor between discharges. Li particles dispersed and “roiled” $> 270^\circ$ around divertor. This result later reproduced.

Implications for LLD ?

Bay C Li particle path (due to E_ϕ ?)



Shot 135060 $t = 5$ ms

Particle
Swarm
Bay C

Upper
Single
Null

Lithium ions
and droplets
spiral upwards
to strike point



3:17 / 7:13

|| (Paused) nstx_1_136150_0-650ms

Lithium Powder Produced Effects Similar to Evaporated Lithium in Neighboring XPs

135049: No Li; 135059: 74mg Li; 135065: 68mg Li

