Discussion Points: chaired by Charles H. Skinner, Robert Kaita PPPL

- LLD surface cleaning
- LLD surface diagnosis
- LLD pumping diagnosis
- LLD pumping sequence
- Implications of results so far on other LLD XPs.
- Potential L-wing / Purdue experiments to narrow uncertainties
- Other…

LLD surface cleaning

LLD Cleaning Technique	Pro:	Con:
Heat LLD to 320 C	Help dissolve surface oxides	Slow, LLD heating 2 deg/min LLD cooling rate 1 deg/min (without air cooling). Needs many hours of LiTER to replace Li evaporated.
He GDC Ne GDC	+ve experience in L wing	Potential for carbon contamination of LLD. Most glow at midplane.
Strike point ≥ 0.7 m	Fast, short duration, high temperature	?
?		

LLD surface diagnosis

Diagnosis Technique	Pro:	Con:
RGA mass 4 / mass 18 ratio $2Li + H_2O > 2LiOH + H_2$	Passive, no run time needed See step when Li melts ? Lab tests ?	Potential H_2O outgassing from neighbor materials.
D-alpha supression due to recycling supression at LLD	Clear local signal	Potential reflections from molten Li (compare to Li emission)
LLD langmuir probe	Local signal	?
LLD appearance	Strong changes seen	Interpretation ?
?		

LLD pumping diagnostics

Diagnosis Technique	Pro:	Con:
MPTS Ne / Te, core and edge	Straight forward Comparison to 2009	Competition from lithiated graphite. Potential changes in ELMs
Loop voltage	Straight forward	Competition from lithiated graphite.
?		
?		
?		

What is threshold sensitivity ?

LLD pumping sequence

Step	Pro:	Con:
50% LLD fill ?	・decreases the physical to geometric area ratio (less Li evaporation) ・desorption of deuterium exacerbated by the high surface-area of the porous Mo, ・mass-limited diffusion into the Li, ・mass-limited retention, ・effective range uncertainty. ・Li to impurity ratio higher (HK)	Needs 55 - 200 h LiTER (HK)
First LLD cold LiTER on, Then LLD hot LiTER on,	Most Li isolated from plasma during setup shots Look for step change when Li melts.	May need to run SP on LLD to break up surface oxides
First LLD hot LiTER on, Then LLD hot LiTER off, Then LLD cold LiTER off	Start with no surface layer. Compare decrease in pumping to LLD cold case	
?		

XPs with LLD in title				run days	% LLD pumping needed ?
LR/CC	**1000**	H. Kugel	LLD Commisioning	3.00	
LR	**1001**	Vlad	LLD Pumping Group XP	2.00	
LR	**1002**	Vlad	Core impurity density and radiated power reduction using variations in LLD divertor conditions	1.00	
ASC	**1006**	Gerhardt	High-kappa Neutral Beam Heated Scenarios with Improved Control and LLD	1.00	
MS	**1021**	Gerhardt	Halo current study w/ extended diagnostic capability + LLD	1.00	
BP	**1049**	Maingi	Dependence of edge profile modifi-cation by lithium to proximity to LLD	0.50	
BP	**1050**	Vlad	Divertor heat flux reduction and detachment studies with impurity seeding and LLD pumping for NSTX-U	0.50	
BP	**1051**	Zweben	Test of LLD Electrodes for SOL Control	0.50	
LR	**1057**	Skinner	D retention with LLD	1.00	
CC/ALL	**1066**	Gerhardt	LLD Physics Survey	2.00	
CC/LR	**1054**	Kugel	LLD deCommissioning	0.50	
			total:	13.00	

Potential L-wing / Purdue experiments to narrow uncertainties

Experiment	Pro:	Con:
?		
?		
?		
?		
?		