

LhARA in-vitro facility parameter list

This document defines the parameters of the LARA facility being studied within the CCAP. The document will be re-issued as required.

Version history

30Oct18 K. Long Draft 0 Zeroth draft for discussion.

Table 1: Table of parameters of the LARA in-vitro facility.

Parameter	Value or range	Unit	Comment
Laser driven proton and ion source		Contact: O. Ettliger and Z. Najmudin	
Laser power	~ 30	TW	Due to sheath acceleration mechanism chosen for reliability
Laser Energy	1	J	
Laser pulse length	30	fs	
Laser rep. rate	10	Hz	
Proton energy	15	MeV	
Proton energy spread	100	%	
Proton beam divergence	~ 30	Degrees	Electrons, Carbon, Oxygen, Neutrons, X-rays
Contaminant radiation	-	-	
Proton and ion capture		Contact: J. Pozimski and C. Whyte	
Gabor lens focal length	0.857	m	
Gabor lens length (end-flange to end-flange)	1.157	m	
Gabor lens cathode radius	0.0365	m	
Gabor lens voltage	65	kV	
Number of lenses	2		
Stage 1 beam transport		Contact: J. Pasternak and W. Shields	
Output beam parameters			
Vacuum window	0.075	mm	
Stage 2 beam transport		Contact: J. Pasternak and W. Shields	
Output beam parameters			
Extraction energy	127.4	MeV	
FFA: Number of cells	10		
FFA: R_{min}	2.92	m	
FFA: R_{max}	3.49	m	
FFA: Number of RF cavities	1		
FFA: RF frequency	2.89-6.48	MHz	
Vacuum window	0.075	mm	
In vitro Biological end stations		Contact: Johnathan Hughes and J. Parsons	
Scintillating fibre layer	0.25	mm	
Air gap	5	mm	
Sample container base	1.15	mm	
Cell layer	0.03	mm	
Cell nutrient solution	15	mm	
Number of end stations	2		
In vivo Biological end station		Contact: Johnathan Hughes and J. Parsons	
Scintillating fibre layer	0.25	mm	
Air gap	5	mm	
Sample container base	1.15	mm	
Cell layer	0.03	mm	
Cell nutrient solution	15	mm	
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