

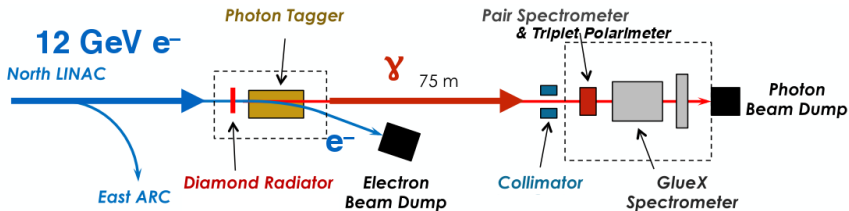
# Hall D and KLF

E.Chudakov<sup>1</sup>

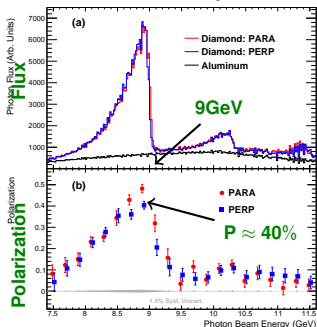
<sup>1</sup>JLab, Hall D manager

KLF Collaboration meeting, JLab, 2020 Dec 9

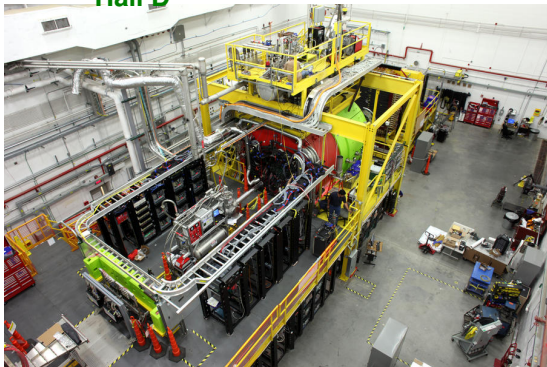
# Hall D Apparatus



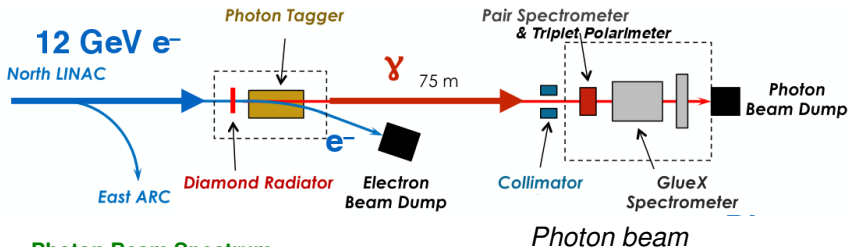
## Photon Beam Spectrum



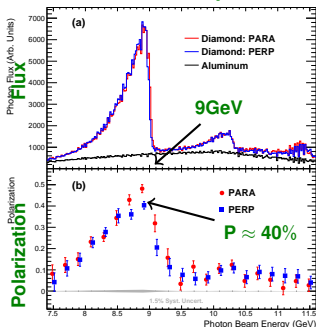
## Hall D



# Hall D Apparatus



## Photon Beam Spectrum



- ▶ Linear polarization
- ▶ Tagging  $\sigma E/E \sim 0.1\%$
- ▶ Pair Spectrometer & Triple Polarimeter

## Spectrometer

- ▶ Acceptance:  $1^\circ < \theta < 120^\circ$
- ▶ Resolutions:  $h^\pm$ :  $\sigma_p/p \sim 1 - 3\%$   
 $\gamma$ :  $\sigma_E/E \sim 6\%/\sqrt{E} + 2\%$
- ▶ Trigger: photoproduction at  $E_{BEAM} > 7 \text{ GeV}$   
In 2020: 85 kHz (signal + EM background)

# Physics Program

Proposal/ experiment	PAC rating	Title	PAC days	PAC #
✓ E12-06-102	A	Mapping the Spectrum of Light Quark Mesons and Gluonic Excitations with Linearly Polarized Photons	120	30
+ E12-10-011	A-	A Precision Measurement of the eta Radiative Decay Width via the Primakoff Effect	79	35
E12-13-003	A	An initial study of hadron decays to strange final states with GlueX in Hall D	200	40
E12-13-008	A-	Measuring the Charged Pion Polarizability in the $\gamma\gamma \rightarrow \pi^+\pi^-$ Reaction	25	40
+ E12-12-002	A	A study of meson and baryon decays to strange final states with GlueX in Hall D	220	42
E12-12-002A	A	Eta Decays with Emphasis on Rare Neutral Modes: The JLab Eta Factory(JEF) Experiment	Grp	45
E12-19-003	B+	Studying Short-Range Correlations with Real Photon Beams at GlueX	15	47
E12-19-001	A-	Strange Hadron Spectroscopy with Secondary KL Beam in Hall D	200	48
E12-13-008A	A-	Measuring the Neutral Pion Polarizability	Grp	48
E12-20-011	A-	Measurement of the high-energy contribution to the Gerasimov-Drell-Hearn sum rule	33	48

+ started    ✓ complete

# Accelerator schedule and runs for 2016-2021

**Note:** the current scale used by the ENP: 1 PAC day = 2 calendar days

Year	start-end mm/dd	$E_e$ GeV	days cal.	days PAC	ABU+ BANU	exper	Comments
<i>Past</i>							
2016	02/03-03/23	12.00	49	28	?	E12-06-102	Engineering run
2017	01/30-03/09	11.67	40	20	58%	E12-06-102	Production start
2018	01/12-03/05	11.62	52	26	52%	E12-06-102	Production
2018	03/29-05/06	11.62	38	19	58%	E12-06-102	Production
2018	09/21-11/26	11.62	66	33	53%	E12-06-102	Production to finish
2018	11/28-12/09	10.30	12	–	–	E12-10-011	Commissioning
2018	12/12-12/18	8.93	7	–	–	E12-10-011	Commissioning
2019	02/08-02/21	11.61	13	6	45%	E12-12-002	1/2 DIRC commis.
2019	02/21-03/05	11.61	15	8	52%	E12-10-011	Production start
2019	03/08-04/15	11.17	38	16	73%	E12-10-011	Production
2019	11/25-12/19	11.40	24	8	34%	E12-12-002	DIRC com.
2020	01/10-05/06	11.40	75	38	63%	E12-12-002	Production start
2020	07/27-09/21	11.40	56	21	46%	E12-12-002	Production

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2020	07/27-09/21	11.40	56	21	46%	E12-12-002	Production
<i>Future</i>							
2021	06/21-08/14	10.10	54			E12-10-011	Production
2021	08/18-10/11	10.90	53			E12-19-003	Production to finish

# Plans for 2022 and later

Experiment	PAC days after 2021	Budget		Comment
		OPS	Capital	
<i>Approved photon beam experiments</i>				
E12-12-002 GlueX-II/JEF	146	regular	\$0.7M FY21	100 days with JEF ~ 1 Y for FCAL2
E12-10-011 PRIMEX- $\eta$	28	regular		
E12-13-008 CPP/NPP	25	\$220k		
E12-20-011 GDH	33		\$0.7M ?	Polarized program ?
	232			25 weeks/FY: 2022-2025
<i>Approved kaon beam experiments</i>				
E12-19-001 KLF	200		\$3.0M ?	3 Y installation/running 1 Y deinstallation

How early can KLF start?

- 2025: finishing the approved photon beam experiments
- DOE S&T Review 2020 recommendation: the relative timing of GlueX-III and KLF?
- Budget for CPS - \$3M (technical design needed)
  - JLab: capital funding - \$0.5-0.7M/FY, start FY23: 2023-2026
  - External funding ?
- Budget for the rest: JLab operations, starting FY23
- JLab: engineering design - gradual
  - CPS: conceptual design needed
  - Other elements: Lab will address the tasks depending on resources