

CBXFEL Performance Parameters

Parameter	XFEL0 (8 GeV linac)	XFEL0 prototype (European XFEL)	XRFEL (LCLS-II-HE)	SR-based XFEL0 (PETRA IV)
Reference	R. Lindberg [PRSTAB 2011], W. Qin [FEL17]	P. Rauer [PhD thesis, UHH 2021]	G. Marcus [PRL 2020]	I. Agapov
Photon energy (keV)	5-25 (@ 14.4)	9.03	6 - 20	5 – 25
RT cavity length (m)	100-300	133	300	100
Undulator length (m)	20-50	20	~108 (magnetic)	30
Operation mode	CW; 1 MHz	Burst; 10 Hz; 500 pulses@2.2 MHz	CW; 1 MHz	CW; 3 MHz; 1-2% duty cycle
Pulses until saturation	100	50-65	5 - 15	-
Energy per pulse in cavity (μ J)	60-750	~4.000	< 100	-
Pulse energy, transmitted (μ J)	2.5-30	~1000	40-8000	5
Photons /pulse, transmitted	$(0.1-1) \times 10^{10}$	$\sim 7 \times 10^{11}$	$\sim 10^{10}-10^{13}$	5×10^9
Coupling fraction (%)	4	20-30	>95	4
Rel. bandwidth (FWHM)	$(1.5-4) \times 10^{-7}$	8×10^{-6}	$1 - 2 \times 10^{-5}$	1×10^{-7}
Bandwidth, (meV, FWHM)	2-6	76	~100	1
Pulse duration, transmitted (fs, FWHM)	500-1900	138	20-40	$> 12 \times 10^3$