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The CXFEL project at Arizona State University

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The CXFEL is designed to produce attosecond-femtosecond pulses of soft X-rays in the range 300-2500 eV using nanobunched electron beams and a very high power laser undulator. The project includes 5 X-ray endstations with applications in biology, quantum materials, and AMO science. The CXFEL Project overall includes both the CXFEL and the nonlasing hard X-ray CXLS that is described elsewhere in these proceedings. The CXFEL has recently completed a 3-year design phase and received NSF funding in March 2023 for construction over the next 5 years. Both CXFEL and CXLS instruments use recently developed X-band distributed-coupling, room-temperature, standing-wave linacs and photoinjectors operating at 1 kHz repetition rates and 9300 MHz RF frequency. They rely on recently developed Yb-based lasers operating at high peak and average power to produce fs pulses of 1030 nm light at 1 kHz repetition rate with pulse energy up to 400 mJ. We present the design and initial construction activities of the large collaborative effort to develop the fully coherent CXFEL.

Footnotes

*For the CXFEL collaboration

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