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## Delhi Light Source: a compact FEL-THz facility

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A compact pre-bunched Free Electron Laser facility named as Delhi Light Source is under construction at IUAC [1]. A low emittance electron beam ( $\sim 4 - 8$  MeV) will be produced by a photocathode based normal conducting RF gun and will be injected into a compact undulator magnet to produce intense THz radiation (0.18 to 2.85 THz). The gun, electron beam transport, undulator and experimental stations for THz will be accommodated inside the newly built class 10000 clean room. The electron gun, already built and tested, is waiting to be installed in the beam line. The Klystron and Modulator will be delivered and installed during the autumn of 2018. The beam optics calculation was initially performed using ASTRA and finally fine-tuned with GPT code. GICOSY code is also being used to perform the transverse beam optics calculation including the achromatic bends. Another code, developed in-house, based on Lienard-Wiechert potential, is used to calculate the parameters of the THz radiation emitted from the wiggling electrons inside the undulator. The design of the laser system is finalized and is being developed in collaboration with KEK, Japan. The design of the photocathode deposition mechanism has been completed and currently is being developed in collaboration with BNL, USA. The design of the undulator magnet is frozen and its development/procurement process has been started. The development and the testing of the undulator magnet is being executed in collaboration with DESY, Germany. The design calculation or parameter finalization of various electromagnets, steering devices, beam optics and beam diagnostic devices are underway. Electron beam and THz radiation are expected to be produced by the beginning and end of 2019, respectively.

### References

1. S. Ghosh et al. NIMB vol. 402, p. 358-363, 2017.

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