Relativistic mirrors for strong-field QED applications

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Relativistic plasma mirrors [1-5], driven by ultra-intense laser pulses [4] or high-energy particle beams [3], have emerged as a promising tool for generating extreme electromagnetic fields and compact sources of high-energy photons. By exploiting the double Doppler upshift [5], these mirrors can produce intensities far beyond current laser technology limits, opening new regimes for studying strong-field quantum electrodynamics (SF-QED). We will discuss our recent results on laser power amplifcation based on relativistic plasma mirrors, and introduce the fundamental principles of laser- and beam-driven relativistic plasma mirrors, highlighting their role and utility for future study of SF-QED phenomena.

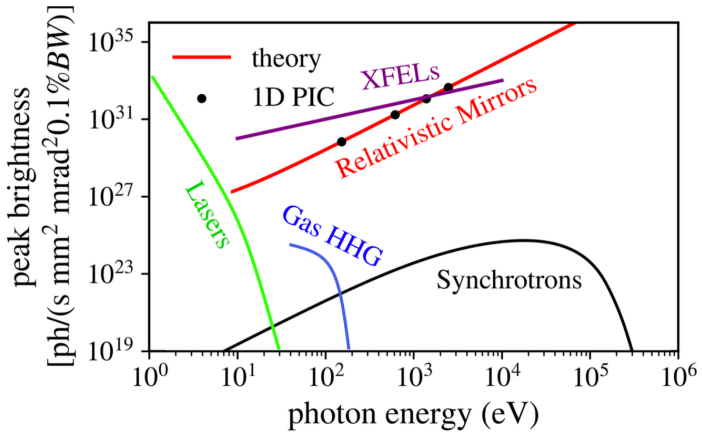

Figure 1. Peak brightness of a 10 mJ laser pulse reflected from a particle-beam-driven relativistic mirror, in comparison to conventional radiation sources.

References

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