

Challenges of 4th generation accelerator-based light sources

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Accelerator-based light sources have become fundamental tools for research in matter physics, medicine, cultural heritage and industry. They span the wavelength range from THz to gamma rays through many and diverse accelerator configurations. The working principles of two families of light sources, synchrotrons and free-electron lasers, are recalled. Technical and physical challenges of their next generation are elucidated, with a focus on nowadays worldwide efforts towards unprecedented level of brilliance and degree of coherence.