

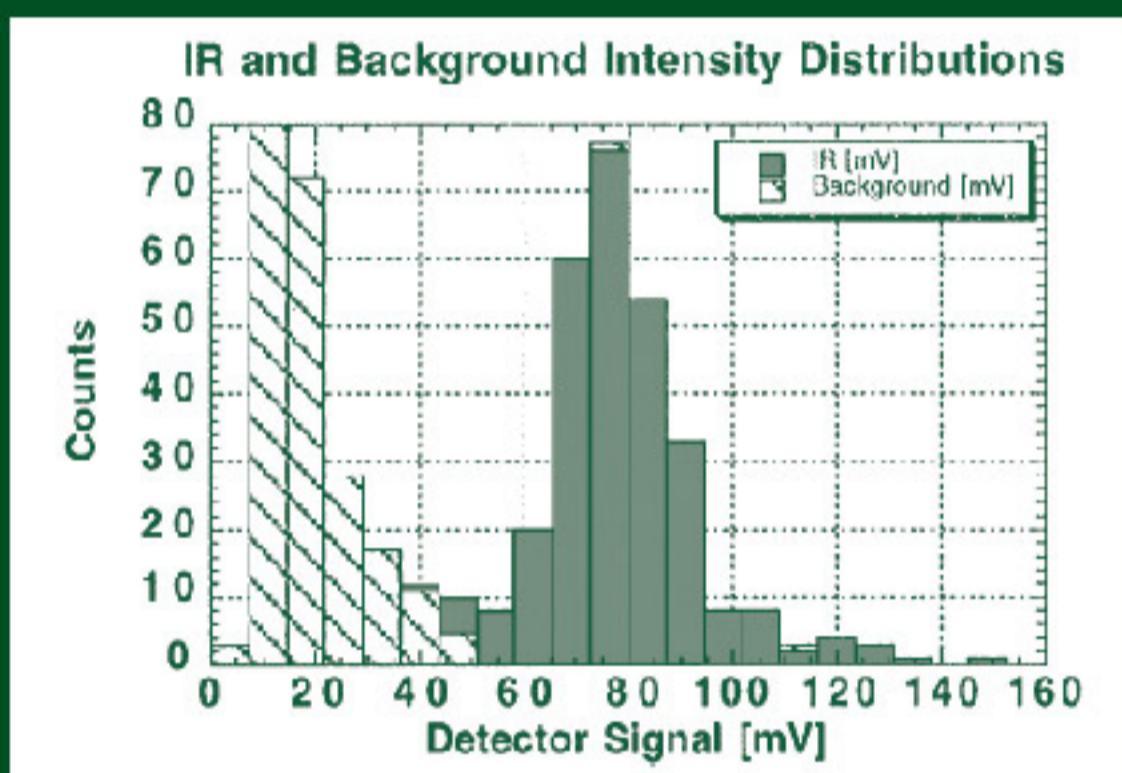
Claudio Pellegrini

Fifth-Generation Free-Electron Laser Light Sources

During the past few years, the Linac Coherent Light Source (LCLS) and the Free-Electron Laser in Hamburg (FLASH) have demonstrated the outstanding capability of free-electron lasers (FELs) as sources of coherent radiation in the soft and hard x-ray region. The high intensity, tens of GW, short pulses (few to less than 100 femtoseconds), and the unique transverse coherence properties are opening a new window to study the structure and

dynamics of atomic and molecular systems. The LCLS, FLASH, and the other FELs now under construction are only the beginning of the development of these light sources. The next generations will reach new levels of performance: terawatt, attosecond, ultra-small line-width, high repetition rate, full longitudinal and transverse coherence. These future developments and the R&D needed to successfully build and operate the next generation of FEL light sources will be discussed.

Claudio Pellegrini, a graduate of the University of Rome, is a Distinguished Professor of Physics, Emeritus, at the University of California, Los Angeles. His research activities are mostly in the areas of collective and non-equilibrium processes in particle beam physics, and their applications to high-energy physics colliders, light sources, and in particular x-ray free-electron lasers. He has held academic appointments at the University of Milan and Trento, Stony Brook University, and the University of California. He has been the co-director and co-founder of the Center for Accelerator Physics at Brookhaven, co-chairman of the National Synchrotron Light Source, chair of the UCLA Department of Physics and Astronomy, chair of the Division of Physics of Beams of the American Physical Society. He is a Fellow of the American Physical Society. His awards include the R.R. Wilson Prize of the American Physical Society, the International Free-Electron Laser Prize, and a Fulbright Fellowship. He is author/co-author of about 250 research papers and books.



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