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Recent results from the Compact Light Source

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Past research at SLAC introduced a new x-ray source concept, a miniature synchrotron light source [1]. This research led to the formation of a corporation, Lyncean Technologies, Inc. to develop the Compact Light Source. The prototype development of the Compact Light Source (CLS) is now complete [2]. The CLS, as reformulated at Lyncean, is a near-monochromatic, tunable, homelab-size, hard x-ray source with beamlines similar to the x-ray beamlines at the synchrotrons—but it is about 200 times smaller than a synchrotron light source. The compact size is achieved using a “laser undulator” and a miniature electron-beam storage ring, in other words—inverse Compton scattering in a miniature storage ring. This presentation will introduce the principles of the Compact Light Source. Next, the design and the testing phase will be discussed. The second “Beta CLS” developed for the “ATCG3D” is being commissioned now [3]. Hardware from both the CLS prototype and the Beta CLS will be shown to illustrate the scope of the effort. The presentation will include the Beta CLS commissioning status and latest experimental results with protein crystallography. Finally, we present recent results from the development of new imaging techniques using the CLS [4].

References

- [1] Z. Huang and R. D. Ruth, “Laser-Electron Storage Ring”, Phys. Rev. Lett., 80:976-979, 1998.
- [2] Supported by the National Institute of General Medical Sciences, the National Institutes of Health, R44 GM66511 and R44 GM074437.
- [3] The Accelerated Technology Center for Gene to 3D Structure (ATCG3D) supported by PSI II, the National Institute of General Medical Sciences and the National Center for Research Resources, NIH, 5U54 GM074961.
- [4] Supported by the National Center for Research Resources, R43 RR025730

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