Closeout of Accelerator Grant DE-FG02-92ER40695
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A. Management Reporting

The recipient must report the following events by e-mail as soon as possible after they occur:

1. Developments that have a significant favorable impact on the project: **None.**
2. Problems, delays, or adverse conditions which materially impair the recipient's ability to meet the objectives of the award or which may require DOE to respond to questions relating to such events from the public. The recipient must report any of the following incidents and include the anticipated impact and remedial action to be taken to correct or resolve the problem/condition: **None.**
3. Any single fatality or injuries requiring hospitalization for five or more individuals: **None.**
4. Any significant environmental permit violation: **None.**
5. Any verbal or written Notice of Violation of any Environmental Safety, and Health statutes: **None.**
6. Any incident which causes a significant process or hazard control system failure: **None.**
7. Any event which is anticipated to cause a significant schedule slippage or cost increase: **None.**
8. Any damage to Government-owned equipment in excess of \$50,000: **None.**
9. Any other incident that has the potential for high visibility in the media: **None.**

B. Scientific/Technical Reports

DOE award number: DE-FG02-92ER40695

Name of recipient: Regents of the University of California, University of California at Los Angeles, Department of Physics & Astronomy

Project title: Advanced Accelerator Physics Research at UCLA

Consortium/teaming members: Consortium/teaming members: Accelerator Test Facility; Brookhaven National Laboratory

Final Technical Report

The grant led to a lot of good scientific results.

- 1) Start of the muon collider in the USA. In 1992 we held the first workshop. Over the period of the 1990s we held five major workshops. Some of these are listed in the references. The DOE started to fund this program at the

national lab. By 1998 this grew to 8 million. In the 2000s the funding remained and now is \$12 million/year for the MAP program. We are part of the MAP program. We invented the Higgs factory muon collider in 1992. Throughout the 1990s and 2000s most of our funding went to the muon collider work.

- 2) In the 1990s we carried out the first test of the plasma lens for positrons. In 2000 this was listed by the APS as one of the most interesting experiments that year.
- 3) We helped start the STELLA program at the BNL-ATF. This involved the acceleration by an inverse FEL. This program was one of the first successful advanced accelerator programs. There were many spinoffs like Compton scattering. About one third of our funds went to this activity.
- 4) More recently (2005 to present) we have continued our work on the muon collider (plasma lens, ring coolers, final coolers) and started an experiment to attempt to accelerate electrons by a laser in vacuum (VLA). After study and simulation we showed that the effect could be observed at the ATF. In spring of 2012 we carried out our first test run and observed the effect. It is now submitted for publication.
- 5) We have produced many PhDs (X.J. Wang, P. He, Lei Shao and three others) during this period – 6 PhDs.
- 6) We have trained postdoctoral people: Kevin Lee, Feng Zhou (now SLAC and in charge of parts of the light source there) and 2 more postdocs.

During the length of this grant many innovations, new programs, and important measurements were made as can be observed in the papers we published. Most important is the MAP program. We are now proposing a Higgs factory muon collider.

Publications

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