Contribution ID: **75** Type: **Contributed Poster**

Investigation of Terahertz Near-Fields Towards Efficient Particle Acceleration

Tuesday, 8 November 2022 17:00 (2h 30m)

THz-frequency accelerating structures could provide the accelerating gradients needed for next generation particle accelerators with compact, GV/m-scale devices. Current THz accelerators are limited by significant losses during transport of THz radiation from the THz source to the acceleration structure. In addition, the broadband spectral properties of high-field laser-driven THz sources make it difficult to couple THz radiation into accelerating structures. A better understanding of the THz near-field source properties is necessary for the optimization of THz transport and coupling. One of the most promising THz generation techniques for accelerator applications is optical rectification in lithium niobate using the tilted pulse front method. We have developed a technique for detailed measurement of the THz near-fields and used it to reconstruct the full temporal 3D THz near-field close to the lithium niobate emission face. Analysis of the results from this measurement will guide the designs of novel structures for use in THz particle acceleration and improve coupling schemes toward enhancing acceleration efficiency.

Acknowledgments

This work was supported by Department of Energy contract DE-AC02-76SF00515.

Primary author: GABRIEL, Annika (SLAC National Accelerator Laboratory)

Co-authors: OTHMAN, Mohamed (SLAC NATIONAL ACCELERATOR LABORATORY); HOFFMANN, Matthias (SLAC National Accelerator Laboratory); OSMAN, Fatima (Santa Clara University); Prof. NANNI, Emilio (SLAC National Accelerator Lab)

Presenter: OTHMAN, Mohamed (SLAC NATIONAL ACCELERATOR LABORATORY)

Session Classification: Poster Session and Reception

Track Classification: Poster Session: WG3 Poster: Laser and High-Gradient Structure-Based Acceleration