Contribution ID: **132** Type: **Poster (student)**

3D-Printed THz Radiator for Pump-probe Experiments

Tuesday, 20 September 2022 19:20 (1 hour)

THz radiation with sufficient intensity finds various applications, including pump-probe experiments in free-electron lasers, wireless communication, material analysis, process control in biology, pharmacy, and medicine. The most common process for generating THz radiation is by optical rectification, in which laser pulses incident to a nonlinear crystal produce broadband THz pulses. A compact and cost-efficient alternative approach uses free electrons passed along a periodic structure, which emits synchronous radiation via the Smith-Purcell effect. In this work, we designed and 3D-print a periodic conical shape structure out of PMMA (n=1.628) to generate and guide the THz radiation. According to our simulation, the THz radiation improves by increasing the refractive index; therefore, we are exploring the use of mixture of quartz or Zirconia with PMMA resin to print the structure.

Primary authors: DADASHI MOTLAGH, Raziyeh; NIEDERMAYER, Uwe (TU-Darmstadt); ISCHEBECK, Rasmus (PSI); SEIDEL, Mike (PSI); ZIMMERMANN, FRANK (CERN)

Presenter: DADASHI MOTLAGH, Raziyeh

Session Classification: Poster Session