



Contribution ID: 2314 Contribution code: TUPL012

Type: **Poster Presentation**

Realistic modeling of fully coherent light sources

Tuesday, 9 May 2023 16:30 (2 hours)

A shared ambition in the R&D of future light sources is designing and constructing an ideal free-electron laser (FEL). Such a machine will produce tunable, multicolor, near transform-limited pulses, with a controlled delay, and fully coherent beams with precisely adjustable phase profiles enabling state-of-the-art measurements and studies of femtosecond dynamic processes with high elemental sensitivity and contrast. For this purpose, a research program towards a fully coherent light source based on generation of higher harmonics at the future superconducting high repetition seeded FEL, FLASH, is ongoing. One of the integral elements of this program is the virtual investigation of characteristics and inherent challenges of external seeding techniques through realistic start-to-end simulations. Some of the highlights of this work will be discussed.

Funding Agency

Footnotes

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Yes

Primary authors: SAMOILENKO, Dmitrii (University of Hamburg); ALLARIA, Enrico (Elettra-Sincrotrone Trieste S.C.p.A.); FERRARI, Eugenio (Deutsches Elektronen-Synchrotron); PANNEK, Fabian (University of Hamburg); PARASKAKI, Georgia (Deutsches Elektronen-Synchrotron); Dr SCHAPER, Lucas (Deutsches Elektronen-Synchrotron); ASATRIAN, Margarit (University of Hamburg); Dr NIKNEJADI, Pardis (Deutsches Elektronen-Synchrotron); AMSTUTZ, Philipp (Deutsches Elektronen-Synchrotron); Dr SCHREIBER, Siegfried (Deutsches Elektronen-Synchrotron); ACKERMANN, Sven (Deutsches Elektronen-Synchrotron); REICHE, Sven (Paul Scherrer Institut); Dr LANG, Tino (Deutsches Elektronen-Synchrotron); HILLERT, Wolfgang (University of Hamburg)

Presenter: FERRARI, Eugenio (Deutsches Elektronen-Synchrotron)

Session Classification: Tuesday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A06: Free Electron Lasers