

# **Free Electron Laser Conference 2009**

**(FEL 2009)**

**Liverpool, United Kingdom  
23-28 August 2009**

**Volume 1 of 3**

**Editors:**

**S. Waller  
V. Schaa  
M. Marx**

**L. Liljeby  
J. Poole  
H. Owen**

**ISBN: 978-1-61738-416-5**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2009) by JACoW-Joint Accelerator Conferences Website  
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact JACoW-Joint Accelerator Conferences Website  
at the address below.

JACoW-Joint Accelerator Conferences Website  
Christine Petit Jean Ganaz  
CERN BE  
CH-1211 Geneva 23

Phone: 41 22 767 32 75

Christine.petit-jean-genaz@cern.ch

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: curran@proceedings.com  
Web: www.proceedings.com

# TABLE OF CONTENTS

Volume 1

## MOOA – OPENING & NEW LASING & FEL PRIZE LECTURES

<b>Stochastic Properties of Self-Amplified Spontaneous-Emission FEL</b> .....	1
<i>S. Krinsky</i>	
<b>Statistical Theory of the SASE FEL Based on the Two-particle Correlation Function Equation</b> .....	38
<i>O. A. Shevchenko, N. Vinokurov</i>	

## MOOB – FEL THEORY

<b>Beam Echo Effect For Generation of Short-Wavelength Radiation</b> .....	82
<i>G. V. Stupakov</i>	
<b>Towards Sub-Ångström Coherent Light Sources: The Quantum FEL</b> .....	122
<i>G. Robb, R. Bonifacio, N. Piovella</i>	
<b>Deep Saturation Dynamics in a Free Electron Laser</b> .....	146
<i>R. Bachelard, C. Chandre, M.-E. Couprie, G. De Ninno, D. Fanelli, X. Leoncini, S. Ruffo, P. De Buyl</i>	
<b>Impact on a Seeded Harmonic Generation FEL of an Initial Energy Chirp and Curvature in the Electron Bunch Energy Distribution</b> .....	158
<i>A. A. Lutman, P. Craievich, G. Penco, R. Vescovo, J. Wu</i>	
<b>Comparison of HGHG and Self-Seeding for the Production of Narrow-Bandwidth Radiation in a Free-Electron Laser</b> .....	179
<i>A. Marinelli, L. Giannessi, C. Pellegrini, S. Reiche</i>	

## MOPC – POSTERS: FEL THEORY; NEW AND EMERGING CONCEPTS; COHERENCE AND PULSE LENGTH CONTROL

<b>Shot Noise Control and Reduction by Collective Coulomb Interactions: 3D Simulations Evidence</b> .....	204
<i>A. Nause, E. Dyunin, A. Gover</i>	
<b>Feasibility Studies for Single Stage Echo-Enabled Harmonic in FERMI FEL-2</b> .....	208
<i>E. Allaria, X. Dao, G. De Ninno</i>	
<b>Self Seeding Configuration at SPARC</b> .....	212
<i>L. Giannessi, A. Bacci, M. Labat, B. Spataro</i>	
<b>Single Spike Radiation Production at SPARC</b> .....	216
<i>V. Petrillo, A. Bacci, M. Boscolo, G. Dattoli, M. Ferrario, L. Giannessi, M. Labat, P. L. Ottaviani, S. Pagnutti, L. Palumbo, C. Ronsivalle, L. Serafini, M. Serluca, C. Vaccarezza</i>	
<b>Seeding Option for the Soft X-ray Beamline of SwissFEL</b> .....	220
<i>S. Reiche, R. Abela, H.-H. Braun, B. Patterson, M. Pedrozzi</i>	
<b>Proposed Extension to the 250 MeV Injector Beamline at PSI for Testing Seeding Options at the SwissFEL</b> .....	224
<i>S. Reiche, R. Abela, B. Beutner, H.-H. Braun, B. Patterson, M. Pedrozzi</i>	
<b>Low Charge Operation of SwissFEL</b> .....	228
<i>S. Reiche, H.-H. Braun, Y. Kim, M. Pedrozzi</i>	
<b>Temporal and Convective Analysis of Free-Electron Laser in Helical Wiggler and Guide Magnetic Fields</b> .....	232
<i>P. K. Mishra</i>	
<b>Coherent Smith-Purcell Radiation: Comparison between Simulations and Experiment</b> .....	236
<i>J. T. Donohue, J. Gardelle</i>	
<b>Numerical FEL Studies with a New Code Alice</b> .....	240
<i>I. Zagorodnov, M. Dohlus</i>	
<b>Harmonic Undulator Radiation and FEL Gain with Two-Peak Electron Beam Energy Distribution</b> .....	244
<i>J. Hussain, V. Gupta, G. Mishra</i>	
<b>Three-Frequency Undulator Radiation and Free-Electron Laser Gain</b> .....	248
<i>S. Tripathi, V. Gupta, J. Hussain, G. Mishra</i>	
<b>Variable Polarized Harmonic Undulator Free Electron Laser and Effect of Beam Energy Spread</b> .....	252
<i>V. Gupta, J. Hussain, G. Mishra</i>	

<b>Nonlocal and Nonlinear Simulation of Harmonic Up Conversion in Two Beam Free Electron Laser .....</b>	<b>256</b>
<i>B. Maraghechi, M. H. Rouhani</i>	
<b>Simulation of Raman Free-Electron Laser Amplifier with Planar Wiggler and Ion-Channel Guiding.....</b>	<b>260</b>
<i>B. Maraghechi, M. H. Rouhani</i>	
<b>Modal Description of Longitudinal Space-Charge Fields in Pulse-Driven Free-Electron Devices .....</b>	<b>264</b>
<i>Yu. Lurie, Y. Pinhasi</i>	
<b>Collective Effects in Pulsed Beam Free-Electron Lasers Operating in the Tera-Hertz Regime .....</b>	<b>268</b>
<i>Y. Pinhasi, Yu. Lurie</i>	
<b>Terahertz Smith-Purcell Radiation Generated from the Periodical Ultrashort Elliptical Bunching Beam .....</b>	<b>272</b>
<i>W. Liu, W.-H. Huang, C.-X. Tang, D. Wu</i>	
<b>Feasibility Study of a Compact XFEL .....</b>	<b>276</b>
<i>T.-Y. Lee, M. S. Chae, J. Choi, H.-S. Kang, M. Kim, I. S. Ko</i>	
<b>Emittance Measurement Procedures for the SwissFEL 250MeV Injector .....</b>	<b>280</b>
<i>B. Beutner</i>	
<b>A Fully 3D Unaveraged, Non-Localised Electron, Parallelized-Computational Model of the FEL.....</b>	<b>284</b>
<i>L. T. Campbell, R. Martin, B. W. J. McNeil</i>	
<b>Simulating Sub-wavelength Temporal Effects in a Seeded FEL Driven by Laser-accelerated Electrons.....</b>	<b>288</b>
<i>S. I. Bajlekov, R. Bartolini, S. M. Hooker</i>	
<b>Derivation of Bunching for Poisson Statistics .....</b>	<b>292</b>
<i>R. A. Bosch, R. J. Bosch</i>	
<b>Effects of Energy Chirp on Echo-enabled Harmonic Generation Free Electron Lasers .....</b>	<b>296</b>
<i>Z. Huang, D. F. Ratner, G. V. Stupakov, D. Xiang</i>	
<b>FEL and Optical Klystron Gain for an Electron Beam with Oscillatory Energy Distribution.....</b>	<b>299</b>
<i>G. V. Stupakov, Y. T. Ding, Z. Huang</i>	
<b>Volume Free Electron Laser with a "Grid" Photonic Crystal with Variable Period: Experiment and Theory.....</b>	<b>303</b>
<i>A. Gurinovich, V. G. Baryshevsky, N. A. Belous, V. A. Evdokimov, E. A. Gurnevich, P. V. Molchanov</i>	
<b>Radiation from a Laser-Plasma Accelerated Electron Beam Passing Through an Undulator .....</b>	<b>307</b>
<i>R. Bachelard, A. Ben Ismail, F. Briquez, S. Corde, M.-E. Couprie, G. De Ninno, J. Faure, M. Labat, G. Lambert, A. Loulergue, O. Lundh, V. Malka, A. Rousse, K. Ta Phuoc</i>	
<b>Potential of FLASH FEL Technology for Construction of a kW-scale Light Source for the Next Generation Lithography .....</b>	<b>311</b>
<i>E. Saldin, E. Schneidmiller, E. Syresin, V. Vogel, H. Weise, M. V. Yurkov</i>	
<b>Photon Diagnostics Requirements and Challenges at the European XFEL .....</b>	<b>315</b>
<i>J. Grünert</i>	
<b>Chirped Pulse Amplification Using a Free-Electron Laser .....</b>	<b>318</b>
<i>X. J. Shu, T. C. Peng</i>	
<b>Beam Transverse Size Effects in the OTR Spectrum as a High Resolution Diagnostic Tool .....</b>	<b>322</b>
<i>G. L. Orlandi, B. Beutner, R. Ischebeck, V. Schlott, B. Steffen</i>	
<b>Gun Laser Systems for the SwissFEL Project.....</b>	<b>326</b>
<i>C. P. Hauri, R. Ganter</i>	
<b>Design Considerations for a THz Pump Source at the SwissFEL .....</b>	<b>330</b>
<i>A. Oppelt, R. Abela, B. Beutner, B. Patterson, S. Reiche</i>	
<b>Start-To-End Simulations of SASE and HHG-Seeded Mode-Locked FEL .....</b>	<b>334</b>
<i>D. J. Dunning, B. W. J. McNeil, N. Thompson, P. H. Williams</i>	
<b>JLAMP: A Next Generation Photon Science Facility at Jefferson Laboratory.....</b>	<b>338</b>
<i>F. E. Hannon, S. V. Benson, D. Douglas, P. Evtushenko, J. M. Klopff, G. Neil, C. Tennant, G. P. Williams, S. Zhang</i>	
<b>The ALPHA-X Beam Line: Toward a Compact FEL .....</b>	<b>341</b>
<i>M. P. Anania, D. Clark, J. A. Clarke, R. C. Issac, D. A. Jaroszynski, M. W. Poole, A. J. W. Reitsma, B. J. A. Shepherd, G. H. Welsh, S. M. Wiggins, M. J. De Loos, S. B. Van Der Geer</i>	
<b>Synchronized Attosecond Pulses for X-ray Spectroscopy .....</b>	<b>345</b>
<i>G. Penn, A. Zholents</i>	
<b>Numerical Simulation of a Compact Terahertz Smith-Purcell Free-Electron Laser.....</b>	<b>349</b>
<i>C. R. Prokop, M. C. Lin, P. Piot, P. Stoltz</i>	
<b>Compact Tunable Compton Scattering Gamma-Ray Sources.....</b>	<b>353</b>
<i>F. V. Hartemann, F. Albert, G. G. Anderson, S. G. Anderson, C. P. J. Barty, A. J. Bayramian, S. M. Betts, T. S. Chu, R. R. Cross, C. A. Ebberts, S. E. Fisher, D. J. Gibson, E. N. Jongewaard, A. Ladran, R. A. Marsh, D. P. McNabb, M. J. Messerly, K. L. O'Neill, T. O. Raubenheimer, V. A. Semenov, M. Shverdin, C. Siders, S. G. Tantawi, A. E. Vlieks</i>	
<b>Microbunching with a Twist.....</b>	<b>357</b>
<i>E. Hemsing, A. Marinelli, P. Musumeci, J. B. Rosenzweig, D. Schiller</i>	

<b>Feasibility Study for a Seeded Hard X-ray Source Based on a Two-Stage Echo-Enabled Harmonic Generation FEL</b> .....	361
<i>D. Xiang, Z. Huang, D. F. Ratner, G. V. Stupakov</i>	
<b>Generation of Attosecond X-ray Pulses Beyond the Atomic Unit of Time Using Laser Induced Microbunching in Electron Beams</b> .....	365
<i>D. Xiang, Z. Huang, G. V. Stupakov</i>	
<b>Two-Chicane Compressed Harmonic Generation of Soft X-Rays</b> .....	369
<i>D. F. Ratner, A. Chao, Z. Huang</i>	
<b>Experiment on Suppression of Spontaneous Undulator Radiation at ATF</b> .....	373
<i>V. Litvinenko, V. Yakimenko</i>	
<b>Evolution of Electron Beam Phase Space Distribution in a High-gain FEL</b> .....	377
<i>S. D. Webb, V. Litvinenko</i>	

### MOOD – OSCILLATOR FELS

<b>A kW Intracavity Power Storage Ring FEL</b> .....	380
<i>Y. K. Wu</i>	
<b>Progress in the Study of an X-ray FEL Oscillator</b> .....	415
<i>K.-J. Kim</i>	
<b>Study of Optical Frequency Chirping and Pulse Compression in a High-Gain Energy-Recovery-Linac-Based Free-Electron Laser</b> .....	439
<i>S. Zhang, S. V. Benson, D. Douglas, G. Neil, M. D. Shinn</i>	

### TUOA – SHORT WAVELENGTH AMPLIFIER FELS

<b>Lasing and Saturation of the LCLS FEL</b> .....	468
<i>P. Emma</i>	
<b>Electron Bunch Compression with Dynamical Non-linearity Correction for a Compact FEL</b> .....	512
<i>T. Hara, H. Tanaka, K. Togawa</i>	
<b>FEL Gain Length and Taper Measurements at LCLS</b> .....	558
<i>D. F. Ratner, A. Brachmann, F.-J. Decker, Y. T. Ding, D. Dowell, P. Emma, W. M. Fawley, J. C. Frisch, A. Gilevich, G. R. Hays, P. Hering, Z. Huang, R. H. Iverson, H. Loos, A. Miahnahri, H.-D. Nuhn, J. L. Turner, J. J. Welch, W. E. White, J. Wu, D. Xiang, G. Yocky</i>	
<b>Design and R&amp;D Progress of the SDUV-FEL</b> .....	593
<i>Z. T. Zhao, Y. Z. Chen, Z. M. Dai, H. X. Deng, Q. Gu, D. G. Li, D. Wang, K. R. Ye, M. H. Zhao, X. F. Zhao, Q. G. Zhou</i>	
<b>Current Status of X-ray FEL Project at SPring-8</b> .....	615
<i>T. Shintake</i>	

### TUOB – NEW AND EMERGING CONCEPTS

<b>Towards Table-Top FELs</b> .....	653
<i>F. J. Gruner, M. Fuchs, A. R. Maier, T. Seggebrock, C. B. Schroeder</i>	
<b>An Intense kHz and Aberration-free Two-colour High Harmonic Source for Seeding FELs from EUV to soft X-ray Range</b> .....	664
<i>G. Lambert, M. Fajardo, J. Gautier, J.-P. Goddet, C. P. Hauri, T. Marchenko, G. Rey, M. Ribiere, A. Sardinha, S. Sebban, F. Tissandier, C. Valentin, P. Zeitoun</i>	
<b>Critical Issues in the Coherent Single Spike Mode Operation with Low Charges</b> .....	676
<i>Y. Kim, H.-H. Braun, T. Garvey, M. Pedrozzi, J.-Y. Raguin, S. Reiche, T. Schilcher, V. Schlott</i>	
<b>Suppression of Short Noise and Spontaneous Radiation in Electron Beams</b> .....	719
<i>V. Litvinenko</i>	

### TUPC – POSTERS: LONG WAVELENGTH FELS; FEL TECHNOLOGY I : ACCELERATORS

<b>Energy Bandwidth Enhancement by Dispersion Correction at FLASH</b> .....	736
<i>E. Prat, W. Decking, T. Limberg</i>	
<b>Beam Tilt at the First Bunch Compressor at FLASH</b> .....	740
<i>E. Prat, C. Gerth, K. E. Hacker</i>	

<b>New Generation for High-Voltage-all-solid-state-Modular-Power-Supplies HiVoMoPS for FEL Applications.....</b>	744
<i>M. Hohmann</i>	
<b>Electron Bunch Momentum Distribution Modulations at PITZ .....</b>	748
<i>M. Hänel, G. Klemz, M. Krasilnikov, J. Rönsch, F. Stephan, I. Will</i>	
<b>Recent Emittance Measurement Results for the Upgraded PITZ Facility .....</b>	752
<i>S. Rimjaem, G. Asova, J. W. Bähr, C. H. Boulware, K. Flöttmann, H.-J. Grabosch, L. Hakobyan, M. Hänel, Ye. Ivanisenko, M. K. Khojayan, G. Klemz, M. Krasilnikov, S. Lederer, M. A. Nozdrin, B. D. O'Shea, M. Otevre, B. Petrosyan, R. Richter, S. Riemann, J. Rönsch, S. Schreiber, A. Shapovalov, R. Spesyvtsev, L. Staykov, F. Stephan, G. Vashchenko, I. Will</i>	
<b>Main Beam Dump Transfer Line for the FERMI@ELETTRA LINAC .....</b>	756
<i>O. Ferrando, E. Karantzoulis</i>	
<b>Laboratory Characterization of Electro Optical Sampling (EOS) and THz Diagnostics for FERMI by Means of a Laser Driven pulsed THz Source .....</b>	759
<i>M. Veronese, M. B. Danatlov, M. Ferianis, D. Filippetto, S. P. Jamison</i>	
<b>The Alignment of the SPARC Facility .....</b>	763
<i>M. Esposito, M. Paris, F. Sgamma, S. Tomassini, M. Troiani</i>	
<b>Characterization of Pure Permanent Magnet Blocks for Undulators in 4<sup>th</sup>-Generation Light Sources.....</b>	766
<i>M. Zambelli, B. Diviacco, M. Kokole, T. Milharci, G. Soregaroli, M. Tedeschi, D. Zangrando</i>	
<b>A Probe Laser Source for Single-Shot EO-Based 3D Bunch Charge Distribution Monitor .....</b>	770
<i>S. M. Matsubara, A. Maekawa, H. Tomizawa</i>	
<b>Effects on Emittance Asymmetry Caused by Asymmetry Fields of Traveling Wave Accelerator Structure.....</b>	774
<i>A. Mizuno, H. Dewa, H. Hanaki, T. Taniuchi, H. Tomizawa</i>	
<b>Development of a 500-kV Photo-Cathode DC Gun for the ERL Light Sources in Japan .....</b>	778
<i>N. Nishimori, R. Hajima, Y. Honda, H. Iijima, M. Kuriki, M. Kuwahara, T. Miyajima, T. Muto, R. Nagai, T. Nakanishi, S. Okumi, M. Yamamoto</i>	
<b>Development of a Thermionic Triode RF Gun.....</b>	782
<i>K. Masuda, K. Kanno, T. Kii, H. Ohgaki, T. Shiïyama, E. Tanabe</i>	
<b>Status of VUV CHG at UVSOR-II.....</b>	786
<i>T. Tanikawa, M. Adachi, M. Hosaka, M. Katoh, Y. Taira, N. Yamamoto, H. Zen</i>	
<b>Development of a Photocathode RF Gun for an L-Band Electron Linac.....</b>	790
<i>S. Kashiwagi, K. Furuhashi, H. Hayano, G. Ioyama, R. Kato, D. Kubo, M. Kuriki, M. Morio, C. Shonaka, N. Sugimoto, H. Sugiyama, Y. Terasawa, J. Urakawa, K. Watanabe</i>	
<b>Longitudinal Phase-space and Transverse Slice Emittance Measurements of High-brightness Electron Beams.....</b>	794
<i>R. Kato, K. Furuhashi, G. Ioyama, S. Kashiwagi, M. Morio, Y. Terasawa</i>	
<b>Femto-Second Profile Monitor Using Pulsed Laser Storage in an Optical Cavity.....</b>	798
<i>K. Sakaue</i>	
<b>Development of an S-band RF Deflector at IHEP .....</b>	802
<i>J. P. Dai, Q. Gu, M. Hou, G. Pei, J. R. Zhang, M. H. Zhao, S. P. Zhong</i>	
<b>S-Band RF System for 0.1nm SASE FEL at PAL.....</b>	805
<i>W. H. Hwang, K. M. Ha, K. R. Kim, S. H. Kim, S. H. Kim, S. S. Park, Y. G. Son, M. Yoon</i>	
<b>Design and Implementation of Bipolar Power Supply for Corrector Magnet.....</b>	808
<i>S.-H. Jeong, B.-K. Kang, D. E. Kim, K.-H. Park</i>	
<b>Characterisation of the Beam from Thermionic RF-Gun Adapted for Photo Cathode Operation .....</b>	811
<i>S. Thorin, F. Curbis, N. Cutic, F. Lindau, S. Werin</i>	
<b>The Test FEL Facility at MAX-lab .....</b>	814
<i>S. Werin, J. Bahrtd, N. Cutic, C. Erny, K. Holldack, F. Lindau, S. Thorin</i>	
<b>Commissioning of a Diode / RF Photogun Combination .....</b>	818
<i>R. Ganter, B. Beutner, S. Binder, H.-H. Braun, M. Broennimann, M. Dach, T. Garvey, C. H. Gough, C. P. Hauri, M. Heiniger, R. Ischebeck, S. Ivkovic, Y. Kim, E. Kirk, F. Le Pimpec, K. B. Li, R. Luescher, P. Ming, A. Oppelt, M. Paraliiev, M. Pedrozzi, J.-Y. Raguin, L. Rivkin, T. Schietinger, T. Schilcher, B. Steffen, S. Tsujino, A. F. Wrulich</i>	
<b>250 MeV Injector Test Facility for the SwissFEL Project.....</b>	822
<i>M. Pedrozzi, Y. Kim</i>	
<b>Technical Design Studies of TAC SASE FEL Proposal.....</b>	826
<i>B. Kettenoglu, P. Arikan, S. O. Ozkorucuklu, O. Sahin, I. Tapan, M. Tural, O. Yavas</i>	
<b>VHF High Repetition Rate Photoinjector Design For The NLS Project.....</b>	830
<i>J. W. McKenzie, B. L. Militsyn</i>	

<b>The Current Status of the ALICE (Accelerators and Lasers In Combined Experiments ) Facility</b> .....	834
<i>S. L. Smith, C. D. Beard, R. K. Buckley, S. R. Buckley, P. A. Corlett, D. J. Dunning, P. Goudket, K. Harada, S. F. Hill, D. J. Holder, F. Jackson, S. P. Jamison, J. K. Jones, L. B. Jones, P. A. McIntosh, J. W. McKenzie, K. J. Middleman, B. L. Militsyn, A. J. Moss, B. D. Muratori, J. F. Orrett, P. J. Phillips, Y. M. Saveliev, D. J. Scott, B. J. A. Shepherd, M. Surman, N. Thompson, P. Weightman, A. E. Wheelhouse, P. H. Williams</i>	
<b>A Recirculating Linac as a Candidate for the UK New Light Source</b> .....	837
<i>P. H. Williams, D. Angal-Kalinin, R. Bartolini, I. P. S. Martin, S. L. Smith, P. H. Williams</i>	
<b>Technical Design of the Baseline Gun for the NLS Project</b> .....	841
<i>J. H. Han, H. C. Huang, S. A. Pande</i>	
<b>Jitter and Tolerance Study of FEL Injectors</b> .....	845
<i>J. H. Han, K. Flöttmann, J. Rowland, S. Schreiber</i>	
<b>Spatial Resolution Limits of YAG:Ce Powder Beam-Profile Monitors at the Fermilab A0 Photoinjector</b> .....	849
<i>A. H. Lumpkin, A. S. Johnson, P. Piot, J. Ruan, J. K. Santucci, Y.-E. Sun, R. Thurman-Keup</i>	
<b>Observations on COTR Due to the Microbunching Instability in Compressed Beams</b> .....	853
<i>A. H. Lumpkin, Y. L. Li, S. J. Pasky, N. Sereno</i>	
<b>Simulation of Coherent Optical Transition Radiation in Linac Based Free Electron Lasers</b> .....	857
<i>R. B. Fiorito, M. Cornacchia, S. Di Mitri, H. Loos, A. G. Shkvarunets, J. C. T. Thangaraj, M. Veronese, J. Wu</i>	
<b>Microbunching from Shot Noise Simulated with Fewer Particles than the Bunch</b> .....	861
<i>R. A. Bosch, K. J. Kleman, J. Wu</i>	
<b>Towards A Multialkali Dispenser Photocathode: Experiment and Theory</b> .....	865
<i>E. J. Montgomery, D. W. Feldman, K. L. Jensen, P. G. O'Shea, P. Z. Pan, N. Sennett, C. Stortstrom</i>	

Volume 2

<b>LCLS Undulator Hall Temperature Control</b> .....	869
<i>J. J. Welch, H.-D. Nuhn, J. A. Sevilla</i>	
<b>Adsorbate Modification of Emission from Diamond Field Emitters and Carbon Nanotubes</b> .....	873
<i>J. D. Jarvis, H. L. Andrews, C. A. Brau, B. K. Choi, J. L. Davidson, W. P. Kang, C. L. Stewart, Y. M. Wong</i>	
<b>Fabrication of Self-Aligned-Gate Diamond Field-Emitter-Array Triodes for Free-Electron Lasers</b> .....	877
<i>J. D. Jarvis, H. L. Andrews, C. A. Brau, B. K. Choi, J. L. Davidson, W. P. Kang, Y. M. Wong</i>	
<b>Pulsed Uniformity Conditioning and Emittance Measurements of Diamond Field-emitter Arrays</b> .....	880
<i>J. D. Jarvis, H. L. Andrews, C. A. Brau, B. K. Choi, J. L. Davidson, B. L. Ivanov, W. P. Kang, C. L. Stewart, Y. M. Wong</i>	
<b>An Inverted Ceramic DC Electron Gun for the Jefferson Laboratory FEL</b> .....	884
<i>F. E. Hannon, S. V. Benson, G. H. Biallas, D. B. Bullard, F. K. Ellingsworth, P. Evtushenko, C. Hernandez-Garcia, K. Jordan, M. Marchlik</i>	
<b>Observation of Coherent Smith-Purcell Radiation Using an Initially Continuous Flat Beam</b> .....	887
<i>J. T. Donohue, L. Courtois, J. Gardelle, P. Modin</i>	
<b>Slippage Effect on the Table-Top THz FEL Amplifier Project in Kyoto University</b> .....	891
<i>T. Kii, M. A. Bakr, K. Higashimura, R. Kinjo, K. Masuda, H. Ohgaki, T. Sonobe, S. Ueda, K. Yoshida, H. Zen</i>	
<b>Consideration on Terahertz FEL using Pre-bunched Electrons Shorter than the Wavelength</b> .....	895
<i>H. Hama, M. Yasuda</i>	
<b>Analysis on the Gain of a Compact Cherenkov Free-Electron Laser</b> .....	899
<i>D. Li, M. R. Asakawa, K. Imasaki</i>	
<b>Development of Compact THz-FEL Based on Laser Photocathode RF Gun System</b> .....	903
<i>R. Kuroda, M. Koike, K. Yamada</i>	
<b>Performance Comparison of Several Double-Modulator Harmonic Generation Schemes on SDUV-FEL</b> .....	907
<i>D. Wang, J. Chen, H. X. Deng, C. Feng, J. Yan</i>	
<b>Operating the SDUV-FEL with the EEHG Scheme</b> .....	911
<i>D. Wang, J. Chen, H. X. Deng, Q. Gu, D. G. Li, M. Zhang, Z. T. Zhao</i>	
<b>Intense THz Radiation Generation from a Compact Electron Linac</b> .....	914
<i>H.-S. Kang, Y.-G. Jung, C. Kim, D. E. Kim, H.-G. Kim, K. R. Kim, W. W. Lee, B. R. Park, J. Park, Y. J. Park, Y. G. Son, H. S. Suh, C. M. Yim, I. H. Yu</i>	
<b>Powerful 30 GHZ JINR-IAP FEM: Recent Results, Prospects and Applications</b> .....	917
<i>N. Yu. Peskov, N. S. Ginzburg, A. K. Kaminsky, S. V. Kuzikov, E. A. Perelstein, S. N. Sedych, A. Sergeev</i>	
<b>Terahertz Electron Masers with Frequency Multiplication</b> .....	921
<i>A. V. Savilov, I. V. Bandurkin, V. L. Bratman, A. K. Kaminsky, N. Yu. Peskov, S. N. Sedych</i>	
<b>Terahertz Band FEL with Advanced Bragg Reflectors</b> .....	925
<i>V. Yu. Zaslavsky, N. S. Ginzburg, K. K. Kamada, A. Malkin, N. Yu. Peskov, A. Sergeev, Y. Soga</i>	

<b>Thermionic Triod RF Gun Simulations for L-band FEL Injectors</b> .....	929
<i>V. Volkov, S. A. Krutikhin, G. Y. Kurkin, S. V. Miginsky, V. M. Petrov, M. A. Tsimov, N. Vinokurov</i>	
<b>Experimental Design of a Single Beam Photonic Free-Electron Laser</b> .....	932
<i>T. Denis, K.-J. Boller, P. J. M. Van Der Slot</i>	
<b>Realization of the Nijmegen THz-FEL</b> .....	936
<i>R. T. Jongma, K. Dunkel, A. C. N. Engels, U. Lehnert, R. W. Lof, P. Michel, C. Piel, W. Seidel, F. J. P. Wijnen, R. Wunsch, G. F. A. J. Wulterkens, V. Zhaunerchyk, P. A. W. Van Dael, A. J. A. Van Roij, A. P. Van Vliet, A. F. G. Van Der Meer, W. J. Van Der Zande</i>	
<b>Spontaneous and Induced Inter-Pulse Coherence in the Nijmegen THz FEL</b> .....	940
<i>V. Zhaunerchyk, R. T. Jongma, W. J. Van Der Zande</i>	
<b>Further Observations of Evanescent Waves in a Smith-Purcell Free-Electron Laser</b> .....	944
<i>H. L. Andrews, C. A. Brau, R. Durant, C. F. Guertin, J. D. Jarvis, T. H. Lowell, M. R. Mross, A. O'Donnell</i>	

## **TUOD – LONG WAVELENGTH FELS**

<b>Novosibirsk Free Electron Laser Facility: Two-orbit ERL Operation with Two FELs</b> .....	948
<i>N. Vinokurov, E. N. Dementyev, B. A. Dovzhenko, Ya. V. Getmanov, B. A. Knyazev, E. I. Kolobanov, V. V. Kubarev, G. N. Kulipanov, A. N. Matveenko, L. E. Medvedev, S. V. Miginsky, L. A. Mironenko, V. Ovchar, B. Z. Persov, V. M. Popik, T. V. Salikova, M. A. Scheglov, S. S. Serednyakov, O. A. Shevchenko, A. N. Skrinsky, V. G. Tcheskidov, Y. F. Tokarev, P. Vobly, N. S. Zaigraeva</i>	
<b>Time-dependent, Three-dimensional Simulation of Free-electron Laser Oscillators</b> .....	1013
<i>H. Freund, W. H. Miner, S. V. Benson, M. D. Shinn, K.-J. Boller, P. J. M. Van Der Slot</i>	
<b>The FEL-THz Facility Driven by a Photo-cathode Injector</b> .....	1040
<i>X. Yang, M. Li, W. Li, X. J. Shu</i>	
<b>Production of Powerful Spatially Coherent Radiation in Free Electron Lasers Based on Two-Dimensional Distributed Feedback</b> .....	1065
<i>N. S. Ginzburg, A. V. Arzhannikov, A. W. Cross, W. He, P. V. Kalinin, I. V. Konoplev, S. A. Kuznetsov, N. Yu. Peskov, A. Phelps, C. W. Robertson, K. Ronald, A. Sergeev, S. L. Sinitsky, V. B. Stepanov, M. Thumm, C. G. Whyte, V. Yu. Zaslavsky</i>	

## **WEOA – FEL TECHNOLOGY I : ACCELERATORS**

<b>Measurements of the LCLS Laser Heater and its Impact on the LCLS FEL Performance</b> .....	1107
<i>Z. Huang, A. Brachmann, F.-J. Decker, Y. T. Ding, D. Dowell, P. Emma, J. C. Frisch, A. Gilevich, G. R. Hays, P. Hering, R. H. Iverson, H. Loos, A. Miahnahri, H.-D. Nuhn, D. F. Ratner, J. L. Turner, J. J. Welch, W. E. White, J. Wu, D. Xiang</i>	
<b>FLASH Status and Upgrade</b> .....	1133
<i>B. Faatz, J. Feldhaus, K. Honkavaara, J. Roßbach, S. Schreiber, R. Treusch</i>	
<b>LCLS Drive Laser Shaping Experiments</b> .....	1167
<i>D. Dowell, A. Brachmann, R. N. Coffee, S. A. Edstrom, P. Emma, A. Gilevich, G. R. Hays, P. Hering, Z. Huang, A. Miahnahri, H.-D. Nuhn, D. F. Ratner, D. A. Reis, W. E. White, J. Wu, D. Xiang</i>	
<b>Field-Emission Cathodes for Free-Electron Lasers</b> .....	1179
<i>J. D. Jarvis, H. L. Andrews, C. A. Brau, B. K. Choi, J. L. Davidson, J. A. Driscoll, W. P. Kang, K. Varga, Y. M. Wong</i>	
<b>Status and Plans for the LBNL Normal-Conducting CW VHF Photo-Injector</b> .....	1205
<i>F. Sannibale, K. M. Baptiste, J. N. Corlett, R. Kraft, S. Kwiatkowski, J. Qiang, J. W. Staples, R. P. Wells, L. Yang, A. Zholents</i>	

## **WEOB – FEL TECHNOLOGY I : ACCELERATORS**

<b>Velocity Bunching Experiment at SPARC</b> .....	1231
<i>D. Filippetto, D. Alesini, A. Bacci, M. Bellaveglia, R. Boni, M. Boscolo, M. Castellano, E. Chiadroni, A. Cianchi, L. Cultrera, G. Di Pirro, M. Ferrario, L. Ficcadenti, V. Fusco, A. Gallo, G. Gatti, L. Giannessi, M. Labat, B. Marchetti, C. Marrelli, M. Migliorati, A. Mostacci, E. Pace, L. Palumbo, M. Quattromini, C. Ronsivalle, J. B. Rosenzweig, A. R. Rossi, L. Serafini, M. Serluca, B. Spataro, C. Vaccarezza, C. Vicario</i>	
<b>Optimisation of a Single-Pass Superconducting Linac as a FEL Driver for the NLS Project</b> .....	1279
<i>R. Bartolini, D. Angal-Kalinin, C. Christou, J. H. Han, F. Jackson, I. P. S. Martin, B. D. Muratori, J. Rowland, M. Venturini, P. H. Williams</i>	
<b>Molecular Dynamics Simulation of Longitudinal Space-Charge Induced Optical Microbunching</b> .....	1332
<i>J. B. Rosenzweig, A. Marinelli</i>	



<b>Running Experience of the Superconducting RF Photoinjector at FZD</b> .....	1351
<i>R. Xiang, A. Arnold, H. Büttig, D. Janssen, M. Justus, T. Kamps, G. Klemz, U. Lehnert, P. Michel, P. Murcek, J. Rudolph, A. Schamlott, M. Schenk, Ch. Schneider, R. Schurig, F. Staufenbiel, J. Teichert, I. Will</i>	

**WEPC – POSTERS: OSCILLATOR FELS; SHORT WAVELENGTH AMPLIFIER FELS; FEL TECHNOLOGY II: POST-ACCELERATOR; STABILITY AND SYNCHRONISATION; NEW SCIENCE FROM FELS**

<b>Theory of Edge Radiation. Part II: Advanced Applications and Impact on XFEL Setups</b> .....	1376
<i>G. Geloni, V. Kocharyan, E. Saldin, E. Schneidmiller, M. V. Yurkov</i>	
<b>Design Study of an Isochronous Bend for a Helical Radiator at the European XFEL</b> .....	1380
<i>Y. Li, W. Decking, B. Faatz, J. Pflüger</i>	
<b>Status of the sFLASH Undulator System</b> .....	1384
<i>H. Delsim-Hashemi, Y. Holler, V. Miltchev, J. Roßbach, A. Schöps, M. Tischer, I. Vasserman</i>	
<b>Technical Design of the XUV Seeding Experiment at FLASH</b> .....	1387
<i>V. Miltchev, A. Azima, J. Bödewadt, F. Curbis, H. Delsim-Hashemi, M. Drescher, S. Düsterer, J. Feldhaus, R. Ischebeck, S. Khan, T. Laarmann, Th. Maltezopoulos, A. Meseck, M. Mittenzwey, J. Roßbach, H. Schlarb, R. Tarkeshian, M. Wieland</i>	
<b>New Superconductive Undulator Designs for use with Laser Wakefield Accelerators</b> .....	1391
<i>G. Fuchert, T. Baumbach, A. Bernhard, S. Ehlers, P. Peiffer, R. Rossmannith, D. Wollmann</i>	
<b>Performance and Parameters of a Novel Talbot Effect Confocal Resonator for mm-wave FEL</b> .....	1395
<i>H. S. Marks, J. Dadoun, O. Faingersh, Kh. Garb, A. Gover, B. Yu. Kapilevich, B. Litvak</i>	
<b>Improvement of a Wiggler by Single Axis Magnetic Measurement, Virtual Synthesis, and Relocation of Magnets</b> .....	1397
<i>H. S. Marks, E. Dyumin, A. Gover, Y. Lasser, R. Shereshevsky, M. Volshonok, A. Yahalom</i>	
<b>On-Line Beam Loss Position Monitors for SPARC</b> .....	1401
<i>L. Catani, F. Broggi, A. Cianchi, D. Di Giovenale, G. Di Pirro</i>	
<b>Measurement of the Timing Jitter Between a Time Reference Signal and EUV-FEL Pulses at XFEL/SPring-8</b> .....	1404
<i>S. M. Matsubara, A. Higashiya, N. Hosoda, S. I. Inoue, H. Maesaka, M. Nagasono, T. Ohshima, Y. Otake, K. Tamasaku, T. Togashi, M. Yabashi</i>	
<b>Undulator Commissioning Strategy for SPring-8 XFEL</b> .....	1408
<i>T. Tanaka</i>	
<b>A Compact Cryogenic ERL-FEL and Laser Cleaning in Nuclear Reactors</b> .....	1412
<i>E. J. Minehara</i>	
<b>Characterization and Fiducialization of the XFEL Undulator Quadrupoles</b> .....	1414
<i>F. Hellberg, H. Danared, A. Hedqvist, Y. Holler, B. Krause, A. Petrov, J. Pflüger</i>	
<b>Investigating the Effect of Mirror Imperfections in Photon Transport Systems for FELs</b> .....	1418
<i>M. A. Bowler, B. Faatz, F. Siewert, K. I. Tiedtke</i>	
<b>Post-Linac Beam Transport and Collimation for the UK's New Light Source Project</b> .....	1422
<i>F. Jackson, D. Angal-Kalinin, J.-L. Fernandez-Hernando, B. D. Muratori</i>	
<b>A Soft X-ray Monochromator for the UK New Light Source (NLS)</b> .....	1426
<i>M. D. Roper</i>	
<b>Design, Modeling, and Optimization of Precision Bent Refocus Optics - LCLS AMO KB Mirror Assembly</b> .....	1430
<i>N. M. Kelez, J. D. Bozek, Y. D. Chuang, R. M. Duarte, D. E. Lee, W. R. McKinney, V. V. Yashchuk, S. S. Yuan</i>	
<b>Calculating the Loss Factor of the LCLS Beam Line Elements for Ultra Short Bunches</b> .....	1434
<i>A. Novokhatski</i>	
<b>Radiation Protection Aspects of the Linac Coherent Light Source Front End Enclosure</b> .....	1438
<i>J. Vollaie, A. F. Fassó, J. C. Liu, X. S. Mao, A. A. Prinz, S. H. Rokni, M. Santana-Leitner</i>	
<b>Experiment on Iodine Transmutation through High-Energy Gamma Ray</b> .....	1442
<i>D. Li, S. Amano, K. Horikawa, K. Imasaki, S. Miyamoto, T. Mochizuki</i>	
<b>Visible FEL Irradiation Experiments on Carbonmonoxy Hemoglobin</b> .....	1445
<i>F. Shishikura, K. Hayakawa, Y. Hayakawa, M. Inagaki, K. Ishikawa, T. Kuwada, K. Nakao, K. Nogami, T. Sakai, I. Sato, T. Tanaka</i>	
<b>Search for Dark Matter Particles with Jefferson Lab's FEL</b> .....	1449
<i>A. Afanasev, O. K. Baker, K. B. Beard, G. H. Biallas, J. R. Boyce, M. Minarni, R. R. Ramdon, M. D. Shinn, P. Slocum</i>	
<b>Simulation of an X-ray FEL Oscillator for the Multi-GeV ERL in Japan</b> .....	1452
<i>R. Hajima, N. Nishimori</i>	

<b>Status of the MIR-FEL Facility in Kyoto University</b> .....	1456
<i>H. Ohgaki, M. A. Bakr, K. Higashimura, Y. U. Jeong, T. Kii, R. Kinjo, K. Masuda, T. Sonobe, S. Ueda, K. Yoshida, H. Zen</i>	
<b>Present Status and Upgrade Plan of the UVSOR-II Free Electron Laser</b> .....	1460
<i>H. Zen, M. Adachi, K. Hayashi, M. Hosaka, M. Katoh, M. Koike, Y. Taira, T. Tanikawa, Y. Uno, N. Yamamoto, J. Yamazaki</i>	
<b>The TAC IR FEL Oscillator Facility Project</b> .....	1464
<i>B. Ketenoglu, H. Aksakal, A. Aksoy, P. Arikani, B. Bilen, H. Duran Yildiz, Ö. Karsli, E. Kasap, S. O. Ozkorucuklu, I. Tapan, M. Tural, O. Yavas</i>	
<b>Overview and Status of the ALICE IR-FEL</b> .....	1467
<i>D. J. Dunning, I. Burrows, J. A. Clarke, D. M. P. Holland, S. Leonard, N. Thompson</i>	
<b>Simulation Studies of the X-ray Free-Electron Laser Oscillator</b> .....	1471
<i>R. R. Lindberg, W. M. Fawley, K.-J. Kim, Yu. Shvyd'Ko</i>	
<b>Free Electron Lasers in 2009</b> .....	1475
<i>W. B. Colson, J. Blau, K. J. Cohn, J. C. Justin, R. J. Pifer</i>	
<b>Impact of Focussing Lattice to European XFEL SASE1 Performance</b> .....	1480
<i>V. Sahakyan, V. G. Khachatryan, A. Tarloyan, V. M. Tsakanov</i>	
<b>Numerical Performance Studies on the new Sliced-Beam-Parameter Measurement Setup for FLASH</b> .....	1483
<i>C. Behrens, C. Gerth, I. Zagorodnov</i>	
<b>Integration of the Optical Replica Ultrashort Electron Bunch Diagnostics with the High-Resolution Coherent Optical Transition Radiation Imager</b> .....	1487
<i>G. Geloni, P. Ilinski, E. Saldin, E. Schneidmiller, M. V. Yurkov</i>	
<b>Method for the Determination of the Three-Dimensional Structure of Ultrashort Relativistic Electron Bunches</b> .....	1491
<i>G. Geloni, P. Ilinski, E. Saldin, E. Schneidmiller, M. V. Yurkov</i>	
<b>A Scheme for Pump-Probe Experiments at an X-Ray SASE FEL</b> .....	1495
<i>E. Saldin, E. Schneidmiller, M. V. Yurkov</i>	
<b>Limitations on the Operation of a Soft X-ray FEL (SASE3) at the European XFEL</b> .....	1499
<i>E. Saldin, E. Schneidmiller, M. V. Yurkov</i>	
<b>Observation of Coherent Optical Transition Radiation and Evidence for Microbunching in Magnetic Chicanes</b> .....	1503
<i>S. Wesch, C. Behrens, B. Schmidt, P. Schmäuser</i>	
<b>Expected Properties of the Radiation from a Soft X-ray SASE FEL at the European XFEL</b> .....	1507
<i>E. Saldin, E. Schneidmiller, M. V. Yurkov</i>	
<b>Electro-optic Electron Bunch Diagnostic at FLASH Using an Ytterbium Fiber Laser</b> .....	1511
<i>L.-G. Wißmann, V. R. Arsov, M. K. Bock, M. Felber, P. Gessler, K. E. Hacker, F. Löhl, F. Ludwig, H. Schlarb, B. Schmidt, S. Schulz, S. Wesch, A. Winter, J. Zemella</i>	
<b>The Second Stage of FERMI@Elettra: A Seeded FEL in the Soft X-ray Spectral Range</b> .....	1515
<i>E. Allaria, G. De Ninno, W. M. Fawley</i>	
<b>FEL Commissioning of the First Stage of FERMI@Elettra</b> .....	1519
<i>G. De Ninno, E. Allaria, M. Cornacchia, G. De Ninno, S. Di Mitri, B. Diviacco, G. Penco, C. Spezzani, M. Trovò</i>	
<b>Seeding Experiments At SPARC</b> .....	1523
<i>M. Labat, D. Alesini, A. Bacci, M. Bellaveglia, R. Boni, M. Boscolo, F. Briquez, B. Carré, M. Castellano, E. Chiadroni, A. Cianchi, F. Ciocci, A. Clozza, M.-E. Couprie, L. Cultrera, G. Dattoli, M. Del Franco, G. Di Pirro, A. Doria, A. Drago, M. Ferrario, L. Ficcadenti, D. Filippetto, V. Fusco, G. P. Gallerano, A. Gallo, D. Garzella, G. Gatti, L. Giannessi, E. Giovenale, B. Marchetti, G. Marcus, M. Mattioli, A. Mostacci, E. Pace, L. Palumbo, A. Petralia, V. Petrillo, M. Quattromini, C. Ronsivalle, J. B. Rosenzweig, A. R. Rossi, E. Sabia, L. Serafini, M. Serluca, I. P. Spassovsky, B. Spataro, V. Surrenti, C. Vaccarezza</i>	
<b>Tolerance Studies for the Hard X-ray Beamline of the SwissFEL</b> .....	1527
<i>S. Reiche</i>	
<b>Single Spike Operation for the Generation of Sub-fs Pulses in the NLS</b> .....	1531
<i>R. Bartolini, J. H. Han, I. P. S. Martin, J. Rowland</i>	
<b>WiFEL: The Wisconsin Free Electron Laser</b> .....	1535
<i>R. A. Bosch, J. Bisognano, M. Bissen, W. Graves, M. A. Green, H. Höchst, K. Jacobs, F. X. Kärtner, K. J. Kleman, R. A. Legg, D. E. Moncton, R. Reiningner, R. Wehlitz</i>	
<b>Design of a Soft X-ray FEL in the SLAC A-Line</b> .....	1539
<i>H. Geng, Y. T. Ding, P. Emma, J. N. Galayda, Z. Huang, Y. Nosochkov</i>	
<b>New Beam Arrival Time Monitors Used in a Time-Of-Flight Injector Measurement</b> .....	1543
<i>M. K. Bock, V. R. Arsov, M. Felber, P. Gessler, K. E. Hacker, F. Löhl, F. Ludwig, H. Schlarb, B. Schmidt, S. Schulz, A. Winter, L.-G. Wißmann, J. Zemella</i>	
<b>Design and Drift Performance of the FLASH Master Laser Oscillator RF-Lock</b> .....	1547
<i>K. E. Hacker, V. R. Arsov, M. K. Bock, M. Felber, P. Gessler, F. Löhl, F. Ludwig, H. Schlarb, B. Schmidt, S. Schulz, A. Winter, L.-G. Wißmann, J. Zemella</i>	

<b>Demonstration of a BPM with 5 Micron Resolution over a 10cm Range</b> .....	1551
<i>K. E. Hacker, V. R. Arsov, M. K. Bock, M. Felber, P. Gessler, F. Löhl, F. Ludwig, H. Schlarb, B. Schmidt, S. Schulz, A. Winter, L.-G. Wißmann, J. Zemella</i>	
<b>Progress Towards a Permanent Optical Synchronization Infrastructure at FLASH</b> .....	1555
<i>S. Schulz, V. R. Arsov, M. K. Bock, M. Felber, P. Gessler, K. E. Hacker, F. Löhl, F. Ludwig, H. Schlarb, B. Schmidt, A. Winter, L.-G. Wißmann, J. Zemella</i>	
<b>Analysis on Variation Factors of Optical Power at the LEBRA FEL</b> .....	1559
<i>K. Nakao, K. Hayakawa, Y. Hayakawa, M. Inagaki, K. Nogami, T. Sakai, I. Sato, T. Tanaka</i>	
<b>Laser Driven RF Signal Generation with an Amplitude Stabilization Technique</b> .....	1562
<i>H. Dewa, T. Asaka, H. Hanaki, T. Kobayashi, A. Mizuno, S. Suzuki, T. Taniuchi, H. Tomizawa, K. Yanagida</i>	
<b>Real Time FPGA Signal Processing for Libera Brilliance Single Pass</b> .....	1566
<i>M. Znidarcic, A. Kosicek, M. O. Oblak</i>	
<b>An Electro-optical System for MAX-lab Test-FEL Facility</b> .....	1569
<i>N. Cutic, C. Erny, F. Lindau, S. Thorin, S. Werin</i>	
<b>Longitudinal Electron Beam Diagnostics Via Upconversion of THz to Visible Radiation</b> .....	1572
<i>G. Berden, W. A. Gillespie, S. P. Jamison, A. Macleod, P. J. Phillips, A. F. G. Van Der Meer</i>	
<b>Electro-optic Bunch Diagnostic on ALICE</b> .....	1575
<i>P. J. Phillips, W. A. Gillespie, S. P. Jamison, A. Macleod</i>	

## **WEOD – COHERENCE AND PULSE LENGTH CONTROL**

<b>Short Pulse Low Charge Operation of the LCLS</b> .....	1578
<i>A. Brachmann, F.-J. Decker, Y. T. Ding, D. Dowell, P. Emma, J. C. Frisch, A. Gilevich, G. R. Hays, P. Hering, Z. Huang, R. H. Iverson, H. Loos, A. Miahnahri, H.-D. Nuhn, D. F. Ratner, J. L. Turner, J. J. Welch, W. E. White, J. Wu</i>	
<b>Study of an HHG-Seeded Harmonic Cascade FEL for the UK's New Light Source Project</b> .....	1606
<i>N. Thompson, R. Bartolini, D. J. Dunning, B. W. J. McNeil</i>	
<b>Spatial Characterization of SASE-FEL of SCSS Test Accelerator</b> .....	1649
<i>P. Mercère, R. Bachelard, S. Bucourt, O. V. Chubar, M.-E. Couprie, G. Dovillaire, J. Gautier, T. Hara, A. Higashiya, M. Idir, T. Ishikawa, H. Kimura, G. Lambert, X. Levecq, M. Nagasono, H. Ohashi, M. Yabashi, P. Zeitoun</i>	
<b>Efficiency and Spectrum Enhancement in a Tapered Free-electron Laser Amplifier</b> .....	1674
<i>X. J. Wang, D. A. Harder, J. B. Murphy, H. J. Qian, Y. Shen, X. Yang, H. Freund, W. H. Miner</i>	

## **THOA – FEL TECHNOLOGY II: POST-ACCELERATORS**

<b>Undulators for the SwissFEL</b> .....	1683
<i>T. Schmidt, S. Reiche</i>	

### Volume 3

<b>LCLS Undulator Commissioning, Alignment, and Performance</b> .....	1742
<i>H.-D. Nuhn</i>	
<b>Selection of the Optimum Undulator Parameters for the NLS: A Holistic Approach</b> .....	1810
<i>J. A. Clarke, N. Bliss, D. J. Dunning, B. D. Fell, K. B. Marinov, N. Thompson</i>	
<b>Undulator Options for Soft X-ray Free Electron Lasers</b> .....	1843
<i>S. Prestemon, D. Schlueter</i>	
<b>Undulator K -Parameter Measurements at LCLS</b> .....	1874
<i>J. J. Welch, R. M. Bionta, A. Brachmann, F.-J. Decker, Y. T. Ding, P. Emma, A. S. Fisher, J. C. Frisch, Z. Huang, R. H. Iverson, H. Loos, H.-D. Nuhn, D. F. Ratner, H. Sinn, P. Stefan, J. L. Turner, J. Wu, D. Xiang</i>	

## **THOB – FEL TECHNOLOGY II: POST-ACCELERATORS**

<b>Recent Results of the SPARC FEL Experiments</b> .....	1925
<i>M. Ferrario</i>	
<b>Results from the Optical Replica Synthesizer at FLASH</b> .....	1972
<i>P. M. Salén, G. Angelova Hamberg, J. Bödewadt, M. Hamberg, S. Khan, M. Larsson, F. Löhl, A. Meseck, E. Saldin, H. Schlarb, E. Schneidmiller, A. Winter, M. V. Yurkov, V. G. Ziemann, P. Van Der Meulen</i>	

<b>Numerical Evaluation of Bulk HTSC Staggered Array Undulator by Bean Model</b> .....	1994
<i>R. Kinjo, M. A. Bakr, K. Higashimura, T. Kii, K. Masuda, K. Nagasaki, H. Ohgaki, T. Sonobe, S. Ueda, K. Yoshida, H. Zen</i>	
<b>Theory of Edge Radiation. Part I: Foundations and Basic Applications</b> .....	2016
<i>G. Geloni, V. Kocharyan, E. Saldin, E. Schneidmiller, M. V. Yurkov</i>	
<b>Photon Diagnostics for the Seeding Experiment at FLASH</b> .....	2035
<i>F. Curbis, A. Azima, J. Bödewadt, H. Delsim-Hashemi, M. Drescher, S. Düsterer, J. Feldhaus, R. Ischebeck, S. Khan, T. Laarmann, Th. Maltezopoulos, A. Meseck, V. Miltchev, M. Mittenzwey, J. Roßbach, H. Schlarb, R. Tarkeshian, M. Wieland</i>	

## **FROA – STABILITY AND SYNCHRONISATION**

<b>High Performance SASE FEL Achieved by Stability-Oriented Accelerator System</b> .....	2054
<i>H. Tanaka, T. Fukui, T. Hara, T. Hasegawa, N. Hosoda, T. Inagaki, S. I. Inoue, T. Ishikawa, Y. Kano, H. Kitamura, C. Kondo, N. Kumagai, H. Maesaka, T. Morinaga, M. Nagasono, H. Ohashi, T. Ohshima, Y. Otake, T. Sakurai, T. Shintake, K. Shirasawa, Y. Tajiri, S. Takahashi, S. Tanaka, T. Tanaka, T. Togashi, K. Togawa, K. Tono, M. Yabashi, M. Yamaga, R. Yamamoto</i>	
<b>Electron Beam Stabilisation Test Results Using a Neural Network Hybrid Controller at the Australian Synchrotron and LINAC Coherent Light Source Projects</b> .....	2096
<i>E. Meier, S. Biedron, G. Leblanc, M. J. Morgan, J. Wu</i>	
<b>Femtosecond Electro-optical Synchronization System over Distance up to 300 m</b> .....	2122
<i>J. Tratnik, B. Batagelj, S. Bucik, M. Ferianis, P. L. Lemut, L. Naglic, L. Pavlovic, B. Repic, P. Ritoso, M. Vidmar, S. Zorzut</i>	
<b>Timing and Synchronisation Considerations for the NLS Project</b> .....	2136
<i>G. J. Hirst, S. P. Jamison, L. B. Jones, A. J. Moss, P. J. Phillips</i>	
<b>RF-based Detector for Measuring Fiber Length Changes with Sub-5 Femtosecond Long-Term Stability over 50 h</b> .....	2162
<i>J. Zemella, V. R. Arsov, M. K. Bock, M. Felber, P. Gessler, K. E. Hacker, F. Löhl, F. Ludwig, H. Schlarb, B. Schmidt, S. Schulz, A. Winter, L.-G. Wißmann</i>	

## **FROB – NEW SCIENCE FROM FELS AND CLOSING REMARKS**

<b>Achieving Microfocus of the 13.5-nm FLASH Beam for Exploring Matter Under Extreme Conditions</b> .....	2187
<i>A. J. Nelson, J. Andreasson, S. Bajt, J. Chalupsky, H. Chapman, T. Dzelzainis, M. Fajardo, R. R. Fäustlin, J. Hajdu, V. Hajkova, L. Juha, M. Jurek, A. R. Khorsand, J. Krzywinski, R. W. Lee, B. Nagler, D. Riley, K. Saks, R. Sobierajski, N. Timneanu, S. Toleikis, T. Tschentscher, S. M. Vinko, J. S. Wark, T. J. Whitcher</i>	
<b>Evidence for Position Based Entanglement in Auger Electron Emission from Dissociating O<sub>2</sub> Molecules</b> .....	2215
<i>U. Becker</i>	
<b>Studying the Secret of Life with FELs</b> .....	2277
<i>P. Weightman</i>	
<b>Saturable Absorption with High VUV FEL Radiation</b> .....	2305
<i>S. M. Vinko, G. Gregori, W. J. Murphy, B. Nagler, J. S. Wark, T. J. Whitcher, S. Bajt, H. Chapman, S. Düsterer, R. R. Fäustlin, T. Laarmann, S. Toleikis, T. Bornath, T. Burian, J. Chalupsky, J. Cihelka, V. Hajkova, L. Juha, T. Doepfner, S. H. Glenzer, R. W. Lee, A. J. Nelson, H. J. Vollmer, T. Dzelzainis, D. Riley, M. Fajardo, M. Kozlova, E. Foerster, I. Uschmann, C. Fortmann, S. Goede, K. H. Meiwes-Broer, A. Przystawik, R. Redmer, H. Reinholz, G. Roepke, R. Thiele, J. Tiggesbaunker, E. Galtier, F. Rosmej, R. Schott, P. A. Heimann, M. Jurek, D. Klinger, R. Sobierajski, F. Y. Khattak, A. R. Khorsand, J. Krzywinski, H. J. Lee, P. Mercère, T. Tschentscher, U. Zastra</i>	
<b>Local Infrared Microspectroscopy with 100nm Spatial Resolution and Application to Cell Imaging</b> .....	2322
<i>A. Dazzi, F. Glotin, C. Mayet, J.-M. Ortega, R. Prazeres</i>	

## **SUPA TUTORIALS**

<b>Introduction to Classical and Quantum High-Gain FEL Theory</b> .....	2358
<i>R. Bonifacio, G. Robb</i>	
<b>Constructing a High-Gain FEL: How to Make it Work</b> .....	2418
<i>P. Emma</i>	
<b>Applications of FELs to New Frontiers in Science</b> .....	2465
<i>J. Marangos</i>	
<b>Abstracts</b>	
<b>Author Index</b>	