Outline

Overview
  ELI-ALPS site, construction status
  Research technology
  Engineering and Integration Division
  Control system structure

Developments
  Control system design, system configuration
  Data collection, archiving, visualization
  Personnel Safety System (PSS)
  Vacuum Control System
  Experiment support – Log book, data acquisition
• Grand opening ceremony on 23 May 2017
• 1st anniversary of moving in
Research technology scheme

Primary sources (laser beams)

High repetition rate (HR) laser:
By 2019-20: 100 kHz, > 5 mJ, < 6 fs, VIS-NIR, CEP
In 2017: 100 kHz, > 1 mJ, < 6.2 fs, VIS-NIR, CEP

Mid-infrared (MIR) laser:
By 2024-25: 10 kHz, > 10 mJ, < 2 cycles, 4 μm-8 μm
In 2017: 100 kHz, > 150 μJ, < 4 cycles, 2.5 μm-3.9 μm

Terahertz pump laser:
By 2020-21: 100 Hz, > 1 J, < 0.5 ps, 1.5 μm-2 μm
By 2018: 50 Hz, > 500 mJ, < 0.5 ps, 1.03 μm

Single cycle (SYLOS) laser:
By 2019-20: 1 kHz, >100 mJ, < 5 fs, VIS-NIR, CEP
In 2017: 1 kHz, >45 mJ, < 10 fs, VIS-NIR, CEP

High field (HF) laser:
By 2024-25: 10 Hz, >2 PW, <10 fs
By 2018: 10 Hz, >2 PW, <17 fs

Secondary sources (attosecond pulses, particles, THz, MIR)

Experiments

Attosecond studies in atomic and molecular physics
Condensed matter physics
Nanophysics, materials science
THz spectroscopy
High resolution imaging
Source development
Plasma physics
Radiobiology

BEAM DELIVERY

Low shielding
Atto1: GHHG HR
Atto2: GHHG HR
Atto3: GHHG SYLOS
Atto4: GHHG SYLOS
MIR
THz1: spectroscopy
THz2: high energy

Medium shielding
Atto5: SHHG SYLOS
Particle1: e− SYLOS

High shielding
Atto6: SHHG HF
Particle2: ion HF
Particle3: e− HF

Particle4: SYLOS
Particle5: SYLOS
Particle6: SYLOS

THz1: high energy
THz2: spectroscopy
MIR: high energy
VIS-NIR: high energy

Condensed matter physics
Nanophysics, materials science
THz spectroscopy
High resolution imaging
Source development
Plasma physics
Radiobiology
Research technology - layout
<table>
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<th>Group</th>
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| Infrastructure Liaison Group         | Requirement and systems engineering  
                                        Project initialization and coordination                                      |
| Mechanical Engineering Group         | Support structures, vacuum chambers, vibration monitoring & isolation            |
| Electrical Engineering Group         | Control and DAQ hardware, Protection / interlock systems  
                                        Timing, cabling, high voltage, etc.                                           |
| Software Engineering Group           | Control software, GUI, logging  
                                        Data acquisition, analysis and archiving                                       |
Control System Structure

- Conceptual design
- Configuration tools
- Adapters
  - uniform connection to devices
- Logical devices
  - uniform treatment of devices
- Subsystems/systems
System Configuration Management

Toolkit

- ConfigEditor
- EnvGenerator
- VirtLoader
- DB Loader
- ProcessMonitor

Presented at ICALEPCS 2017:
doi: 10.18429/JACoW-ICALEPCS2017-THBPA06
Data collection, archiving, visualization

- Email/SMS notifications defined
- Currently based on custom processes
Personnel Safety System (GUI)
Under development

- Main interface is PLC HMI panel
- Extra GUI only for visualization/monitoring
- Overview and zoomed views with log messages
Vacuum Control System
Under development
Experiment support

Data acquisition for a SHHG (Solid High Harmonic Generation) experiment

LogBook webapplication
THANK YOU FOR YOUR ATTENTION!