The Extreme Light Infrastructure
European Project

SOFIA UNIVERSITY IN EXTREME LIGHT INFRASTRUCTURE

Kick-off meeting

February 20-21, 2008

Paris,
Feb, 20

NSF Bulgaria

Sofia University "St. Kliment Ohridski"

Students ~ 30 000
staff ~ 3000

The Sofia University “St. Kliment Ohridski” is the oldest university in Bulgaria (since 1888) and is the largest and most advanced educational and research centre in Bulgaria.

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European Project

PHYSICS DEPARTMENT

ANNUAL ENROLMENT
120..150 STUDENTS

Astronomy , Atomic Physics , Condensed Matter , General Physics , Meteorology and Geophysics , Methodology of Physics , Nuclear Engineering , Optics and Spectroscopy , Physics of Semiconductors , Quantum Electronics , Radiophysics and Electronics , Solid State Physics and Microelectronics , Theoretical Physics

http://www.phys.uni-sofia.bg/

Paris,
Feb, 20

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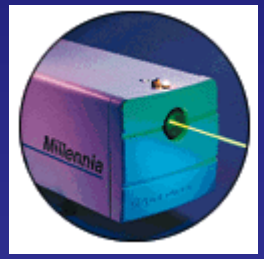
Quantum Electronics Division



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eli

Sofia University team

Laboratory for Femtosecond Photonics

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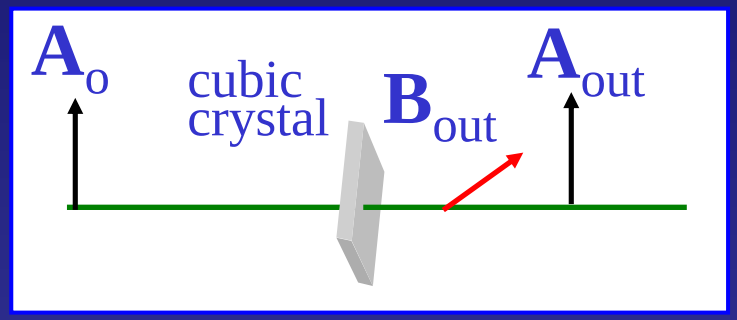
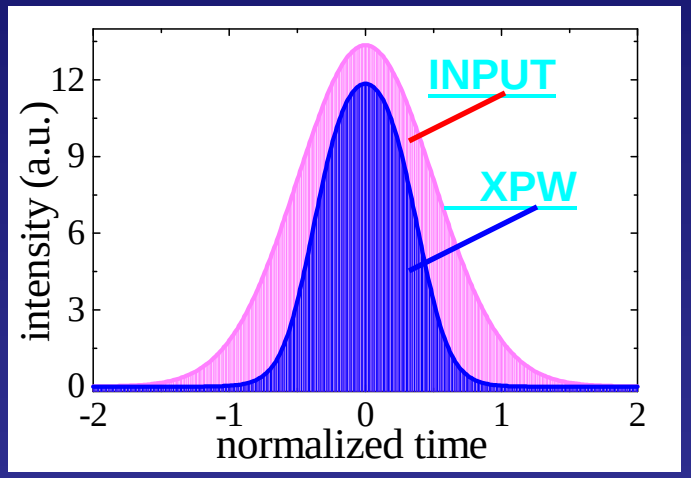
Scientific contribution

Sofia University team has expertise in improving temporal contrast parameters of femtosecond pulses with nonlinear optical methods in crystals . We have worked on this topic for the last 5 years in collaboration with group in LOA-ENSTA. The results are very encouraging.

Cross-polarized wave generation





+ output at the same wavelength

+ improvements for both temporal and spatial shapes

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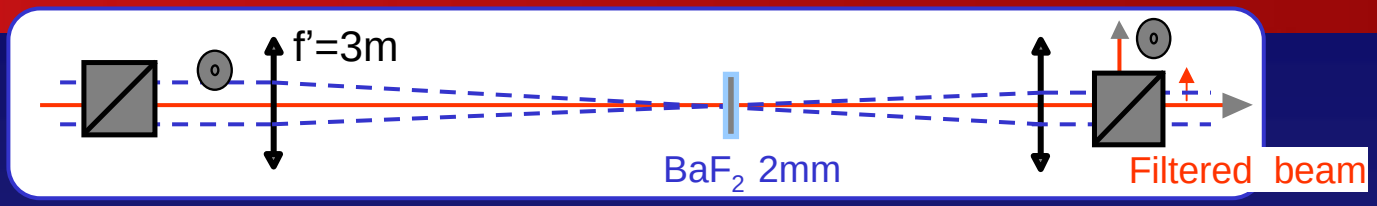

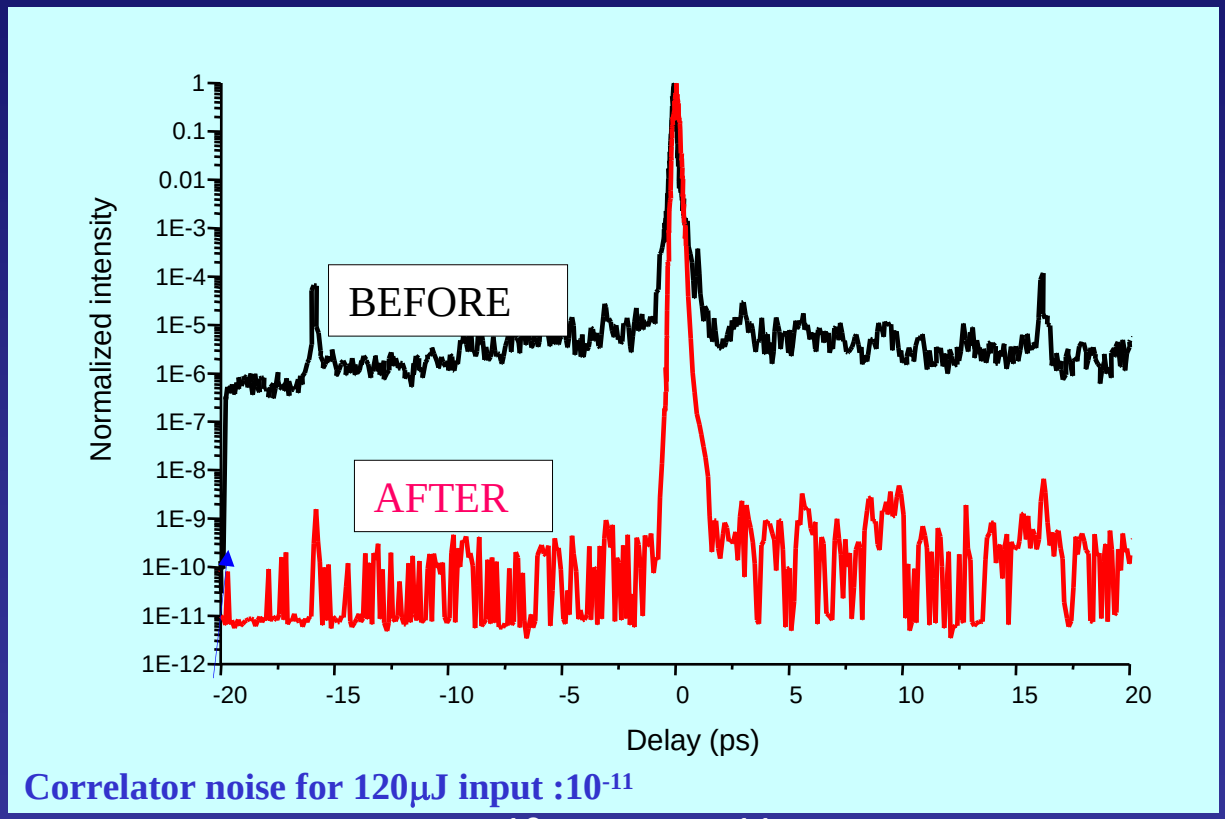

Correlator noise for 120μJ input :10^{-11}

Contrast achieved 10^{-10} … 10^{-11} with efficiency 20%

Cross-polarized wave generation

Our plan is to continue to work in following directions:

- **Optimization of crystal orientation - not only [001] cut**
- **Search for new nonlinear crystals - not only BaF2**
- **To investigate the XPW generation effect in UV region**
- **Search for suitable nonlinear crystals and conditions good for cross polarized wave generation with extremely short pulses <10fs**

ATTOSCIENCE

Sofia University team has a long time experience on modeling of femto-attosecond pulse generation, amplification and interaction with matter.

During the ELI preparatory phase we can do research on femto- and attosecond quantum dynamics of atoms, molecules, and condensed phases (incl. nanostructures).

Also relativistic and ultrarelativistic electron dynamics, and radiation in the field of high-power femto (atto) second pulses can be studied.

Sofia University team has had long and fruitful collaboration with various European laser institutes, including those with LOA-ENSTA and with MPQ-Garching. We are quite enthusiastic to continue working in a multinational team as ELI and to contribute to the success of its preparatory phase.

THANK YOU FOR YOUR ATTENTION