

## Tailored generation of laser pulses with improved power and duration

CSIC has developed a method that improves the characteristics of the signal in ultra-fast fiber laser systems. The accurate control of the polarization of light in such lasers leads to the generation of shorter and more powerful pulses. The system is compatible with multiple fiber laser designs (including closed-cavities and ring lasers) reliant on the use of doped fiber amplifiers, regardless of their initial polarization management requirements.

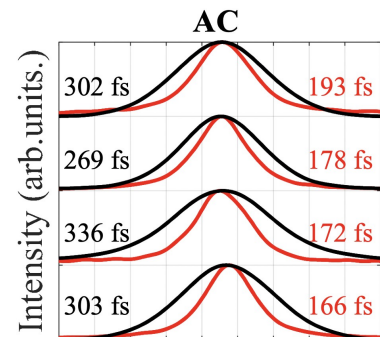
Industrial partners in the optics industry are being sought to collaborate through a patent licence agreement for the manufacture and commercialization of systems that incorporate this technology.

### An offer for Patent Licensing

#### Shorter and more powerful pulses with adjusted polarization

Most ultrafast fiber lasers currently available require the accurate handling of the polarization of the signal in all the sections of the laser, which often imposes limitations on the flexibility of their design.

Our system allows for a controlled modification of the light's polarization properties before its insertion into the fiber the amplification stage, by using the effect known as *polarization hole burning* in order to obtain an optimized spectral response from the amplifier, that can be used to reduce the duration of the output pulses and increase their peak power.



Example of a reduction of the duration of pulses in a femtosecond laser by applying this system, measured in an autocorrelator. In black: original laser. In red: by using the patented technology.

#### Main innovations and advantages

- The technology is compatible with a wide variety of fiber laser systems.
- It allows for an adaptive response of the output signal by accurately modifying the polarization before the amplification stage.
- It allows obtaining higher power laser pulses, of shorter length and duration.
- This improved response can be used to better the performance in applications such as telecommunications, material processing or marking, supercontinuum generation, environmental monitoring, biomedicine or optical coherence tomography, among others.

#### Patent Status

Priority patent application filed suitable for international extension

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