

FOR IMMEDIATE RELEASE

Biophotonic Solutions Inc. Technology Used in Photosynthesis Experiments at the University of Chicago

EAST LANSING, Mich., Oct. 29, 2013 – [Biophotonic Solutions Inc.](#) (BSI), the world leader in automated [laser pulse compression](#), announces that its “[MIIPS](#)” laser pulse characterization and compression technology was used in a two-dimensional (2D) electronic spectroscopy setup for photosynthesis experiments by researchers at the University of Chicago (UChicago). The UChicago team aimed to reveal the quantum mechanical effects behind photosynthesis, laying groundwork for future development of solar energy devices that exhibit more efficient energy transfer than current technologies.

The UChicago team engineered pairs of closely coupled synthetic molecules that simulate the behavior of the photosynthetic structures found in plants. They then used 2D electronic spectroscopy to examine the coupling between the pairs. The researchers were able to establish that clear quantum mechanical signatures are found in these arrangements of electronically coupled molecules. Furthermore, they observed and measured the lifetime of these quantum effects. The experiments both probed the underlying quantum mechanics of photosynthesis and showed that these qualities can be engineered into synthetic models.

The 2D electronic spectroscopy method required pairs of phase-coherent ultrashort laser pulses to be delivered at the sample reliably on a daily basis. The researchers used BSI’s MIIPS technology-based “femtoJock” pulse shaping system to compress the pulses to just 11 femtoseconds, without need for tedious manual laser tweaking. BSI’s femtoJock system provides automated ultrafast laser pulse measurement, compression, and shaping in real time, ensuring that optimized laser pulses are ready when users need them.

“Professor Greg Engel at the University of Chicago runs a very advanced laser spectroscopy research group and we are happy that they chose a BSI system,” said Kiyomi Monro, BSI CEO. “This is a great example of how a MIIPS-based instrument can be used in a demanding spectroscopy application to deliver femtosecond-range laser pulses to the sample consistently and reliably. With optimized laser pulses available on demand, the UChicago team could focus on their research rather than spending invaluable time adjusting the laser.”

For complete details on the photosynthesis experiments, please see “Engineering Coherence Among Excited States in Synthetic Heterodimer Systems,” by Dugan Hayes, Graham B. Griffin, Gregory S. Engel, *Science* 21 June 2013: 340 (6139), 1431-1434.

(<https://www.sciencemag.org/content/340/6139/1431.abstract>)

About Biophotonic Solutions Inc.

Biophotonic Solutions Inc. (BSI; <http://www.biophotonicsolutions.com/>) is the world leader in automated, adaptive [femtosecond laser](#) pulse compression and shaping. BSI develops, licenses,

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and sells cost-effective solutions that drive the ultimate performance from lasers for high-precision imaging, material processing, and other applications where transform-limited ultrafast pulses are desirable at the focal plane. BSI's products, based on exclusively licensed technology, unlock the latent power of ultrafast lasers for industrial, scientific, medical, and defense applications.

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