



Multidimensional Fourier Transform Infrared Spectrometer for Cost-Effective Laser Systems

[View U.S. Patent No. 9,052,239 in PDF format.](#)

WARF: P100283US01

Inventors: Martin Zanni, Peter Hamm, Jan Helbing

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a multidimensional spectrometer with simplified, cost-effective construction.

Overview

Two-dimensional spectroscopy can reveal interactions between coupled systems of atoms and/or molecules. Advanced spectroscopy techniques including two-dimensional infrared (2-D IR) and electronic (2-D E) laser spectroscopy have been developed in the last decade. Understanding of the physics and chemistry behind these techniques has matured to the point that applications ranging from energy research to chemical physics are now able to incorporate these technologies. Currently, applications are limited to research laboratory environments due to the high technological and cost requirements associated with the creation of a user-friendly multidimensional spectrometer. A 2-D IR and 2-D E spectrometer with a simple, robust and inexpensive design would allow these advanced techniques to be introduced to the commercial market.

The Invention

A UW-Madison researcher has developed a simplified and robust multidimensional spectrometer that encodes frequency information into laser pulses traveling along two optical paths. This allows a multidimensional spectrograph to be generated.

Applications

- Spectroscopic equipment component or add-on providing cost-efficient 2-D IR and 2-D E spectroscopy
- Provides multidimensional spectroscopic measurements in the infrared, visible and ultraviolet regions of the electromagnetic spectrum
- Facilitates measurement of inter- and intra-molecular interactions that can be used to study molecular binding, structures or kinetics

Key Benefits

- Simplifies construction of a multidimensional spectrometer, reducing cost for quick-to-market commercial applications
- Reduces component cost by more than 30 percent
- Permits flexible acquisition patterns that may be tailored for specific requirements

Stage of Development

We use cookies on this site to enhance your experience and improve our marketing efforts. By continuing to browse without changing your browser settings to block or delete cookies, you agree to the storing of cookies and related technologies on your device. [See our privacy policy.](#)

Additional Information

OK



WARF
Wisconsin Alumni Research Foundation

| info@warf.org | 608.960.9850

For More Information About the Inventors

- [Martin Zanni](#)

Related Technologies

- [For information about an improved multidimensional spectrometer previously developed by the inventor, see WARF reference number P07420US.](#)

Related Intellectual Property

- [View Continuation Patent in PDF format.](#)

Publications

- Skoff D.R., Laaser J.E., Mukherjee S.S., Middleton C.T. and Zanni M.T. 2013. Simplified and Economical 2D IR Spectrometer Design Using a Dual Acousto-Optic Modulator. Chem. Phys. 422, 8-15.

Tech Fields

- [Analytical Instrumentation, Methods & Materials : Spectroscopy.](#)

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867

We use cookies on this site to enhance your experience and improve our marketing efforts. By continuing to browse without changing your browser settings to block or delete cookies, you agree to the storing of cookies and related technologies on your device. [See our privacy policy.](#)



OK



WARF
Wisconsin Alumni Research Foundation

| info@warf.org | 608.960.9850