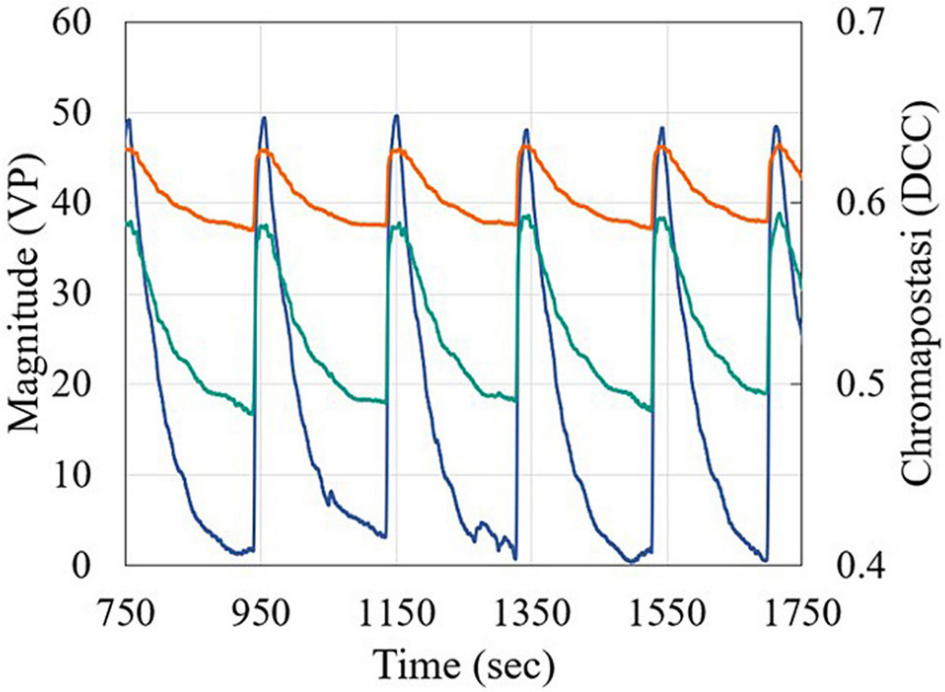
eConnection

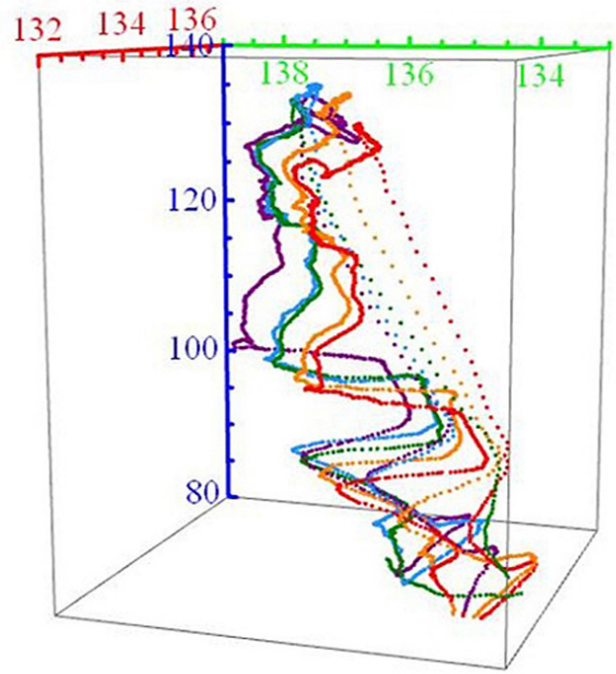
Updates for the S&T community

Color research published in chemistry journal

Posted by Velvet Hasner

On August 4, 2020





Research on the use of a new video-based colorimetry (the quantitative determination of color) method has been published in *Talanta*, an international journal of pure and applied analytical chemistry.

The research team includes Dr. Rainer Glaser, S&T's chair and professor of chemistry; Dr. Joseph Schell, a 2020 Ph.D. graduate in chemistry from the University of Missouri-Columbia; and Sara McCauley, a junior in chemistry at Missouri S&T.

Colorimetry has useful applications in diverse areas that call for quantitative analysis. Many methods have been proposed for translating the RGB data of a digital image to obtain concentration information about the colored component of a solution, according to Glaser. RGB is a color model in which red, green and blue light are added together to produce an array of colors.

The team's paper validates a new method of translating the RGB color values of a video or image into a chemical concentration using vector analysis in 3-D color space by direct comparison to independent concentration measures using methods such as ultraviolet-visual (UV-Vis) spectroscopy.

With their method, the researchers studied an oscillating reaction that features a periodic color change between colorless and yellow. They were surprised to observe "hysteresis loops," or small, systematic changes in color that had not previously been detected due to the limited resolution of UV-Vis spectroscopy.

Glaser says their method will enable new scientific information about oscillating chemical reactions to be observed. The method doesn't require expensive equipment, is easily generalized to new systems, and can detect small changes with high temporal resolution other methods cannot.

Read the paper, titled "Video colorimetry of single-chromophore systems based on vector analysis in the 3D color space: Unexpected hysteresis loops in oscillating chemical reactions."

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