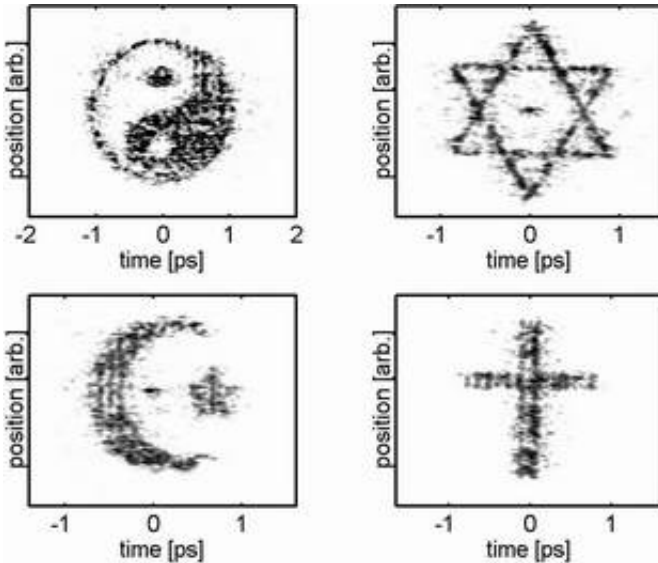


Season's Greetings at the Speed of Light

December 23 2004



MIT presents an ultrafast holiday offering

Most days, MIT chemist Keith Nelson and his team do cutting-edge research with femtosecond laser pulses—flashes of light that last about a thousandth-of-a-trillionth (10⁻¹⁵) of a second, or roughly the amount of time it takes a light beam to cross from one circuit feature to the next in a conventional computer chip.

And most days, the scientists are focused on the serious, long-term applications of their work, which include a variety of potential uses in fundamental science, as well as in communications and signal-processing technologies.

Image: Each image shows the "snapshot" of a highly structured, half-millimeter-wide laser pulse. The vertical axis is in arbitrary units; the horizontal axis is in picoseconds (10⁻¹² seconds), which refers to the time when that part of the pulse arrived at the detector. Credit: Joshua C. Vaughan, T. Feurer and Keith A. Nelson, MIT

As 2004 draws to a close, however, Nelson and his coworkers have demonstrated their techniques for shaping and manipulating the femtosecond pulses with a seasonal offering. Each of the symbols shown here is actually a highly structured, half-millimeter-wide swarm of laser photons flying in formation from left to right at the speed of light. The images are produced by analyzing the photons in an ultrafast detection system, then plotting their vertical position and time of arrival.

Result: the world's fastest holiday greeting.

Source: MIT

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