

SLOW LIGHT

On-chip pulse compression

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A chip-based temporal compressor for shortening the duration of optical pulses has been developed by scientists in Japan. The scientists at Yokohama National University made their compressor from a silicon photonic crystal waveguide. Co-propagating slow light is used as a control pulse and serves to induce carrier plasma dispersion in the waveguide through two-photon absorption. The efficiency of the effect is greatly enhanced due to the control pulse propagating in the slow-light regime. The induced dispersion is used to spectrally broaden or 'chirp' a signal pulse. Dispersion compensation, invoked by a series of seven pairs of integrated heaters spaced along the length of the waveguide, is then used to compress the pulse. Using the scheme, the team report compressing a 13.9 ps input pulse down to a duration of 1.4 ps, corresponding to a compression factor of 9.9. OG