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**Narrowband spectroscopy by all-optical correlation of broadband pulses** XIAOJI XU, STANISLAV KONOROV, University of British Columbia, JOHN HEPBURN, VALERY MILNER — High peak power ultrafast lasers are widely used in nonlinear spectroscopy but often limit its spectral resolution because of the broad frequency bandwidth of ultrashort laser pulses. Improving the resolution by achieving spectrally narrow excitation of, or emission from, the resonant medium by means of multi-photon interferences has been the focus of many recent developments in ultrafast spectroscopy. We demonstrate an alternative approach, in which high resolution is exercised by detecting narrow spectral correlations between broadband excitation and emission optical fields. All-optical correlation analysis, easily incorporated into the traditional spectroscopic setup, enables direct, robust and simultaneous detection of multiple narrow resonances with a single femtosecond pulse.

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