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Dual channel system for two-photon excited fluorescence-based relative measurements of high accuracy two-photon absorption spectra NIKOLAY MAKAROV, JOEL HALES, JOSEPH PERRY, Georgia Institute of Technology — We describe an experimental setup for reliable relative measurements of two-photon absorption spectra of organic molecules. The set-up utilizes tunable femtosecond laser system with optical parametric amplifier (OPA) and covers excitation wavelengths in the range 550-1600 nm. It utilizes two channels for simultaneous measurements of the unknown sample and the reference, such that all the pulse-to-pulse laser instabilities cancel out during measurements. Using the setup we measure absolute two-photon absorption (2PA) spectra of 4 commercial organic dyes (Rhodamine 640, Rhodamine 700, LDS-698 and LDS-798) with an estimated accuracy 15%. The data are corrected for the variations of the pulse duration and the beam profile with the excitation wavelength, and are applicable as secondary reference standards for 2PA measurements of the compounds with the emission wavelengths 600-800 nm.

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