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New laser based X-ray source at 100 Hz repetition rate for ultrafast XAS LUDOVIC LECHERBOURG, MARION HARMAND, MARINA SERVOL, SYLVAIN FOURMAUX, JEAN-CLAUDE KIEFFER, Universite du Quebec INRS-EMT, Varennes J3X 1S2, Canada — X-ray absorption techniques allow studying the atomic environment and the electron structure of specific atoms in complex material. Using ultrafast x-ray sources produced by femtosecond laser combined with optical pump and x-ray probe geometry, these techniques can be extended in the time domain with an ultrafast resolution. We present here our most recent progress in the development of a femtosecond time resolved x-ray absorption spectroscopy (XAS) system based on a broadband soft x-ray source produced by an ultrafast 100 Hz repetition rate laser system. This femtosecond XAS is designed to probe the electronic dynamics ocurring during the vanadium dioxide (VO2) semiconductor to metal phase transition following excitation by a femtosecond laser pulse. In the present experiments, broadband spectra near the vanadium L edge (511 eV) and the oxygen K edge (525 eV) have been generated and measured. Static VO2 absorption spectra in the metallic an the semiconductor phase will be presented.

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