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Ultrafast Laser -Induced Absorption Changes in Half-Metallic CrO2 HAILONG HUANG, KEOKI SEU, ANNE REILLY, College of William and Mary, WILLIAM EGELHOFF, YAGIL KADMON, National Institute of Standards and Technology, ANNE REILLY COLLABORATION, WILLIAM EGELHOFF COLLABORATION — Half-metals are ferromagnetic materials in which the electrons are fully spin polarized at the Fermi level. They are important materials seeing application as spin injectors and other spintronics devices. Chromium dioxide (CrO2) is a simple half-metal which has shown experimentally the highest degree of spin polarization. Here we present our recent ultrafast optical study of CrO2. An ultrafast pump-probe technique was applied to investigate the laser-induced absorption change of the material. A dramatic change in induced absorption was observed near the phase transition temperature. The induced absorption was also dependent on the probe beam polarization relative to the crystal c axis. The experimental results are compared with the similar phenomena observed in half-metallic manganites[1]. We have also investigated the wavelength dependence of the absorption change. We will discuss the results based on the calculated band structure by previous researchers[2]. [1]. Y. H. Ren et al. J. Appl. Phys., 91, 7514 (2002) [2]. M. A. Korotin et al., Phys. Rev. Lett., 80, 4305 (1998)

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