

ACOUSTICS2008/2247**Thickness dependence of the acoustical response of ultra-thin metallic films studied by Colored Picosecond Ultrasonics**

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We have previously demonstrated [1,2] that a connection exists between Colored Picosecond Ultrasonic (CPU) experiments and electronic structure of metallic thin films. Indeed, a strong change of the detected acoustic echoes is observed when the laser is tuned around an interband transition wavelength. This connection suggests that CPU can be an useful tool for measuring interband transitions in thin metallic films. Surprisingly, by doing such a measurement on a series of ultra-thin Aluminium films, we observed a significant shift of the transition (from 880 to 970 nm) as the film thickness is reduced (from 400 to 120 Å). We will discuss the origin of the phenomenon and propose some applications to the characterization of ultra-thin metallic films. [1] A. Devos and C. Lerouge, Phys. Rev. Lett. 86, 2669 (2001) [2] A. Devos and A. Le Louarn, Phys. Rev. B 68, 045405 (2003)