

Abstract Submitted
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Collective Excitations in Ultrathin Magnesium Films on Silicon¹ XIAO GUANG LI, Fudan University, Shanghai, China, U of Tennessee, U of Sci. & Tech. of China, DI XIAO, Oak Ridge National Laboratory, JIAN SHEN, Fudan University, Shanghai, China, HANNO WEITERING, U of Tennessee, Oak Ridge National Laboratory, ZHENYU ZHANG, U of Sci. & Tech. of China, Harvard U — We present a systematic study of plasmon excitation in ultrathin Mg overlayer on Si(111) substrate. Our numerical results qualitatively reproduce the experimentally observed plasmon spectra of the Mg/Si systems [1]. The underlying physics of the formation of various absorption peaks can be understood using the simple hybridization concept. Based on this concept, the coexistence of surface and bulk plasmons in the experimental observation turns out to be a clear evidence for the existence of multiple surface plasmons due to the quantum confinement in Mg thin films [2]. In addition, we clearly see the plasmon enhanced substrate absorption, which comes from the screening of the substrate to the oscillatory charges.

[1] Ao Teng et al.(to be published).

[2] Xiaoguang Li et al.(to be published).

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