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X-ray reflectivity and diffuse studies of lipid bilayer stacks on solid substrates GANG CHEN, M. MUKHOPADHYAY, Y. MA, SUNIL K. SINHA, Department of Physics, University of California, San Diego, C. DECARO, J. BERRY, LAURENCE B. LURIO, Department of Physics, Northern Illinois University, Z. JIANG, Advanced Photon Source, Argonne National Laboratory, A. BROZELL, D. BRICARELLO, ATUL N. PARIKH, Departments of Applied Science and Biophysics Graduate Group, University of California, Davis — Recently, major efforts have been made to study model lipid membranes supported on a solid substrate. A typical bilayer is characterized by its static structure and dynamic thermal fluctuations which are described by three physical quantities, the bending modulus, the surface tension, and the external potential due to a nearby surface or neighboring bilayers. The solid substrate affects both the static and dynamic behaviors of the bilayer deposited on its top. We have carried out a systematic study of 1,2-dipalmitoyl-sn-glycero-3-phosphoethanolamine (DPPE) bilayer stacks up to five bilayers prepared with Langmuir-Blodgett (LB) and Langmuir-Schaeffer (LS) methods. A complete picture of the static bilayer structure, both in-plane and out of plane, and the dynamic fluctuations as a function of temperature and the number of stacks, i.e., the distance from the substrate, is obtained with x-ray reflectivity, Grazing Incidence Small Angle X-ray Scattering (GISAXS), and rocking scans. (Work supported by NSF, DMR0706369)

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