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Superconductivity from two dimensional interfaces: CuCl/Si, GaP/Si, ZnS/Si[1] S.H. RHIM, R. SANIZ, A. J. FREEMAN, Northwestern University — Two-dimensional (2D) interfaces of hetero-bonded semiconductor superlattices are studied using the highly precise FLAPW [2] method. The 2D system, of metal-insulator-metal, is one of the candidate geometries to realize the excitonic mechanism of superconductvity, [3] where T_C can be greatly enhanced over phonon mediation. Epitaxially grown CuCl on Si (111) was reported to exhibit an anomalous diamagnetic susceptibility at 60$\sim$150 K. [4] For all superlattices, 2D metallicity was found at the interfaces due to charge transfer from the polarity mismatch, [5] as evidenced by their bands, Fermi surfaces, and charge densities. The T_C, calculated within the crude RMTA and the McMillan-Hopfield formula, is 0.04$\sim$4.4K for the CuCl/Si case, but vanishes for the other cases. To pursue the excitonic mechanism, we are determining the Kernel function $K(\omega)$, i.e. the average of the effective Coulomb interfaction, with **q** dependent dynamic screening. First results for CuCl/Si show $K(\omega)$ to be attractive for a certain energy range

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