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Enhanced Superconductivity in Bilayered Systems SAURABH BASU, Dept. of Physics, IIT Guwahati — We investigate superconducting correlations in bilayered systems. The planes are described by a two-dimensional $t_{\|}-J_{\|}-U$ with $t_{\perp}$ and $J_{\perp}$ denoting the interplanar parameters. These interplanar couplings when coupled with hopping anisotropies in the planes may account for a host of unusual superconducting properties. Our main focus is to calculate superconducting correlations (using BCS theory) for various regions of the parameter space formed by the interplanar variables. For $t_{\perp} = 0$ (confining the carriers in planes) and $J_{\perp} < J_{\|}$, the pairing correlations are found to be purely planar. Further we generalize to $t_{\perp} \neq 0$ and $J_{\perp}/J_{\|} = \left(t_{\perp}/t_{\|}\right)^2$ and find that pairing correlations are enhanced at lower densities with increasing $t_{\perp}$. The most dramatic effect sets in when, additionally the planar hopping frequencies are made highly anisotropic ($t_y \ll t_x$) and $J_{\perp} \sim J_{\|}$. A small $t_{\perp}$ increases T_c as much as *four* times when compared with the calculations performed for a single layer (PRB, **66**, 144507 (2002)). Straightforward generalizations to more number of layers is discussed with a goal to study crossover to the bulk 3D limit.

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