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Spin waves of 2D J_1-J_2 model and single hole dynamics via nearest neighbor hole hopping SATYAKI KAR, University of North Florida — We study the two dimensional J_1-J_2 model using the spin wave approximation and find the spin wave modes at different values of parameter λ=J_2/J_1. Competing antiferromagnetic (π, π) and $(\pi, 0)$ (or, $(0, \pi)$) orders preferred by the J_1 and J_2 terms respectively creates frustration in such a system and the spin wave excitations about different vacuum states are observed for different values of λ. We investigate the stability of different zero spin deviation states as λ is varied from 0 to 1.5. We discuss the band folding of the super-lattice structure that appears with the emergence of the J_2 term and study the different spin wave modes that the system inherits. Dynamics of a foreign hole put in such a system is studied using a t-J_1-J_2 model and the hole spectra obtained by solving the Dyson's equation self-consistently within the non-crossing approximation are compared with the ARPES spectra from the newly discovered FeAs superconducting compounds.

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