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Self-organized Electronic Extended van Hove Singularity as Electron- lattice Dynamic Confinement Effect SERGEI MUKHIN, Theoretical Physics Department, Moscow Institute for Steel and Alloys — A mechanism of self-organized one-dimensionality in correlated electron systems is proposed. It is found that unidirectional dynamic confinement of electron motion by quantum lattice vibrations may cause transition into ordered state with extended electronic van Hove singularities. This may explain observed enhancement of the ordering instability in the anti-nodal regions of the "Fermi surface" in the under- and optimally doped high-T_c cuprates. It is shown that ordered electrons in the anti-nodal regions bind with quantum lattice vibrations that obey "selection rules": $Q/\Omega = z_s/g$, wherez_s are zeros of the Bessel function $J_0(z)$, and Q is amplitude of lattice vibration with frequency Ω, g is electron-lattice coupling strength in the force units. Confining potential of these vibrations creates one-dimensional "nesting" of the Floquet indices of electronic states, provoking electronic ordering transition. The transition is destructed by external magnetic field with the Larmour frequency $\Omega_L \geq \Delta^2/\hbar t_\perp$, here Δ is ordered electrons energy-gap; $t_\perp/t_\| \ll 1$ are bare hopping integrals of the anisotropic electron tight-binding model.

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