$$T_c = \frac{8\gamma}{\pi}(\mu - \varepsilon_o)\, exp\left[- \frac{2^{1/2}\pi^2 d\,(\mu - \varepsilon_o)^{1/2}}{g m_x^{1/2} P_{y0}} \right], \tag{13}$$

if $\mu - \varepsilon_o \gg T_c$, or

$$\mu - \varepsilon_o \ll \left(\frac{g m_x^{1/2} P_{y0}}{\pi d} \right)^2 \sim E\,\lambda_o^2, \tag{14}$$

where $E \sim 1$ eV, λ_o is the usually normalized dimensionless interaction constant. In the opposite case, $\mu - \varepsilon_o \ll T_c$,

$$T_c = 0.0093 \left(\frac{g m_x^{1/2} P_{y0}}{d} \right)^2 \sim E\,\lambda_o^2 . \tag{15}$$

In this extreme case $T_c \sim 100$K corresponds to $\lambda_o \sim 0.1$, i.e. smaller than in the usual low-temperature superconductors. However even in this case the ratio $2\Delta/T_c$ is 3.795 (in case $\mu - \varepsilon_o \gg T_c$ it has the usual value 3.52). Since the experimental value is closer to 6, a weak coupling theory is probably insufficient for numerical predictions and can serve only for a qualitative analysis.

4. GAP ANISOTROPY. THE E-L MODEL [14]

The same authors as well as the Stanford group has observed another property of the photoemission spectra: the anisotropy of the energy gap Δ. This was done in BSCCO - the only substance, where the ARPES technique permitted to observe a gap. Since the value at the minima fell below the resolution threshold, this was interpreted as a firm proof of the so called d-wave pairing, where the order parameter changes sign and has nodes. Actually none of these statements can be proven, since in these experiments only the magnitude of the order parameter is measured, and the resolution is finite. In case when the interaction between electrons is mediated by phonons (as this can be concluded from the isotope effect, which we will discuss later) there are no arguments in favor of d-wave pairing (such a simmetry of the order parameter appears, if the interaction is mediated by spin fluctuations or is a result of Coulomb repulsion). Therefore it can be asked whether such an anisotropy is possible within the phonon scheme.

In usual superconductors, even with an anisotropic basic energy spectrum the gap is rather isotropic (anisotropy less than 10%). This is due to the isotropy of the interaction between electrons mediated by phonons. Even in case of a high state density in some regions of the quasi-momentum space the equation of the type