$\overline{|T^{(2)}|^2} \ll \beta \overline{|T^{(1)}|^2}$, and this means that the states of electrons in the N-layers have to be different from those in the S-layers. If one thinks more thoroughly about the S-N model, one encounters another assumption, which looks rather strange. In the original Hamiltonian (3) it is implicitly supposed that the Fermi-circles in the normal and superconducting layers are exactly the same. Otherwise the energy and momentum conservation laws would be violated. But this means equal number of electrons (or holes) in both types of layers, which is unlikely. If there were a pronounced anisotropy in one of the layers (as in YBCO) that would not be necessary, since the Fermi surfaces could just cross at some points. But in BSCCO there is no substantial anisotropy.

There is a possible way to resolve these contradictions, namely to assume that the electrons in the N-layers form a continuous band of localized states (as occurs in Anderson localization). Then there is no momentum conservation. Such an assumption is compatible with small tunneling matrix elements, since for effective tunneling a rapid change of occupancy of the surface states is necessary, and if the states are essentially localized, this happens very slowly.

In this connection it should be mentioned that the situation in the 1-2-3 substances is entirely different. A model of two types of superconducting layers, one of them being isotropic and the other quasi-1-dimensional, looks more appropriate.

3. EXTENDED SADDLE POINT SINGULARITIES [10].

Usually the angle resolved photoemission spectroscopy (ARPES) is applied for determination of the Fermi surface in cases where the usual methods, e.g. de Haas - van Alfen, or Gantmakher oscillatory effects in thin single crystalline films, fail for some reason. Such a situation happens in the high T_c cuprates, because the normal state corresponds to such high temperatures that all the oscillations vanish, and destruction of superconductivity by magnetic field at lower temperatures requires tremendously large magnetic fields. J.C.Campuzano and K.Gofron from Argonne managed to increase the resolution of their experiments to such an extent that they were able to find not only the Fermi surface but also the electron energy spectrum in the vicinity of the Fermi energy. Since the cuprates are quasi-2D substances, the energy depends very weakly on one of the components of the quasimomentum, say k_z, and can be considered mostly as function of $\boldsymbol{k}$ - the quasimomentum in the a-b plane. They discovered that this dependence has not simple saddle points but what they called "extended saddle points" - rather long regions in the $\boldsymbol{k}$ plane, where the energy depends only on one component of the momentum. These regions are confined to the boundaries of the Brillouin zone. Their location and the curves illustrating the function $\varepsilon(k_x,k_y)$ are given at Fig.6, 7.