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Possible importance of charge fluctuation in BiS_2 superconductors KATSUHIRO SUZUKI, HIDETOMO USUI, KAZUHIKO KUROKI, Department of Physics, Osaka University — Studying the pairing mechanism of various layered superconductors may help extracting the essence of the high T_c layered superconductors. Recently, new series of superconductors possessing BiS_2 layer has been discovered. Their maximum T_c reaches 10.6K in $LaO_{1-x}F_xBiS_2$, and the origin of the pairing glue is under debate. In the STM/STS experiment, "checkerboard stripe" charge order has been observed on the surface of $NdO_{0.7}F_{0.3}BiS_2$, and also the existence of some kind of fluctuation has been suggested in NQR. These observations suggest the importance of charge fluctuations in this system. In this present study, we study the possibility of charge/orbital fluctuation mediated superconductivity in these materials. The bands around the Fermi level consists of Bi 6p and S 3p orbitals. They are more spread than d orbitals and have strong anisotropy, so we consider orbital dependent inter-site interactions between Bi and S besides the intra-site ones. We find that the orbital dependent inter-site interaction enhances $d_{x^2-y^2}$ quadrupole susceptibility and tendency toward nematic orbital order. We discuss the possibility of superconductivity enhanced by this kind of charge/orbital fluctuations.

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