Correlation of superconductivity with the apical oxygen ordering.  

1 C. Q. JIN, Q. Q. LIU, H. YANG, R.C. YU, X.M. QIN, L. X. YANG, Y. YU, F.Y. LI, Institute of Physics, Chinese Academy of Sciences — We discuss the evolution of superconducting transition temperature (Tc) with the ordering state at the apical oxygen layer of a high temperature superconductor (HTS). This study became available in Sr$_2$CuO$_{3+\delta}$ superconductor with K2NiF4 structure showing so far rarely formed partially occupied apical oxygen which also acts as the dopant. With observation of a series of modulation structures at apical oxygen layer, we found a well-defined links between Tc (from 75 to 95 K) and modulated structures. We address that the distribution geometry of dopant such as the partially occupied apical oxygen here can be an additional route to reach further higher Tc.

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