

# How the SO(5) k=1 WZW near-CFT3 explains the underdoped regime of the cuprate high temperature superconductors

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There is now much theoretical evidence that quantum spin liquids proximate to the Neel state on the square lattice are associated with the near-CFT3 described by the SO(5) non-linear sigma model with a level k=1 Wess-Zumino-Witten term. I will use a method of ancilla qubits to describe the confining states obtained when such an antiferromagnet is doped. Key features of the near-CFT3 help explain numerous experiments on the cuprates including (i) d-wave superconductivity with 4 nodal quasiparticles with anisotropic velocities, (ii) quantum oscillations in the charge-ordered states, (iii) higher energy RIXS spectra, and (iv) recent observations of the Yamaji effect in the pseudogap.

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