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Electrostatically induced phase transitions in superconducting complex oxides LI HAN, CARLOS SÁ DE MELO, School of Physics, Georgia Institute of Technology — We describe quantum phase transitions in superconducting complex oxides which could be tuned by electrostatic charge transfer. Using a simple model for the superconductivity of a thin film or surface of a bulk copper oxide, we show that tuning the carrier density may allow the visitation of spin-density-wave antiferromagnetic phase as well as several superconducting phases with different pairing symmetries such as extended s- (se), d- and ($se \pm id$)-wave. For a specific model with nearest neighbor attraction, we obtain the phase diagram in the interaction versus filling factor space showing the boundaries of the possible phases. Finally, we calculate the superfluid density and penetration depth as characteristic properties of the superconducting phases.

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