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Possible Explanation of the Fermi Arcs in Cuprates, based on a clustered superconducting state above Tc[1] GONZALO ALVAREZ, Oak Ridge National Laboratory, ELBIO DAGOTTO, University of Tennessee and ORNL — A previously introduced Landau-Ginzburg model [1] to describe the competition between antiferromagnetism and d-wave superconductivity in the cuprates is here further investigated. The state above the critical temperature Tc is made of superconducting (SC) clusters, with a nonzero amplitude of the SC order parameter but random phase factors, coexisting with antiferromagnetic(AF) regions. This state disappears above a higher temperature scale T*. The LDOS of this state is in good agreement with recent STM experiments [2]. Our main result is that the angle-resolved photoemission spectrum of this SC-AF clustered state contains Fermi surface arcs in the region Tc<T<T*, very similar to those observed experimentally [3]. Low energy states created at the interface between clusters are responsible for the arcs. [1] G. Alvarez et al., Phys. Rev. B 71, 014514 (2005). [2] K. K. Gomes et al., Nature 447, 569 (2007). [3] A. Kanigel et al., cond-mat/0708.4099 (2007).

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