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Critical Exponents and Cluster Analysis on STM Studies of a Cuprate Superconductor BENJAMIN PHILLABAUM, ERICA CARLSON, Purdue University, KARIN DAHMEN, University of Illinois at Urbana-Champaign — In this presentation we will show results from a new kind of analysis for surface probes allowing us to gather some information about the bulk behavior of the sample that is studied. This presentation will introduce the analysis in as general a way as practical and use a particular example to concretely demonstrate how it can be applied. The particular example is the case of a local nematic order observed in a Scanning Tunneling Microscopy (STM) experiment on a BSCCO sample from which we determine which model best describes the behavior of nematic orientation using critical exponents derived from the properties of clusters and correlations of these orientations. These results would highlight key physical contributions to the nematic's orientation and guide further studies into the underlying physics. We fully expect similar impact on the study of other systems for which this analysis can be performed.

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