Imaging Locally Oriented Charge Modulations in a Cuprate Superconductor JENNIFER HOFFMAN, ELIZABETH MAIN, Harvard University, BENJAMIN PHILLABAUM, Purdue University, HIROSHI IKUTA, Nagoya University, ERIC HUDSON, Penn State University, KARIN DAHMEN, University of Illinois, Urbana-Champaign, ERICA CARLSON, Purdue University — We use scanning tunneling microscopy to image the local orientation of the static charge modulations in Bi$_{2-y}$Pb$_y$Sr$_{2-z}$La$_z$CuO$_6$+$x$, for samples spanning a wide range of doping. For each sample, we compute the size distribution of locally $x$-oriented and locally $y$-oriented clusters. We analyze the size distributions within a random field Ising model to obtain the fractal dimension and other critical exponents. We discuss the utility of scaling collapse to extract the critical doping $x_c$ of the smectic charge order in Bi$_{2-y}$Pb$_y$Sr$_{2-z}$La$_z$CuO$_6$+$x$. 

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