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High precision measurements of quantum critical properties for 3D quantum antiferromagnets ZI YANG MENG, YAN QI QING, Institute of Physics, Chinese Academy of Sciences, BRUCE NORMAND, Renmin University, ANDERS SANDVIK, Boston University — Using large-scale quantum Monte Carlo (QMC) simulations, we study the quantum phase transitions in three-dimensional S=1/2 dimerized Heisenberg antiferromagnets. We obtain high precision results on the quantum critical properties of the transition from antiferromagnetically ordered phase to the magnetically disordered dimerized phase. With careful finite size scaling analysis and improved estimator of physical observables in the QMC simulations, we are able to extract the precise logarithmic corrections to quantum phase transition in our system governed by the 3+1 O(3) universality class. Finite temperature quantum critical properties in excitation spectra are obtained as well.

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