Reentrance and ultrametricity in three-dimensional Ising spin glasses HELMUT G. KATZGRABER, Department of Physics and Astronomy, Texas A&M University and ETH Zurich, CREIGHTON K. THOMAS, Department of Materials Science and Engineering, Northwestern University, ALEXANDER K. HARTMANN, Department of Physics, Oldenburg University, Germany — We study the three-dimensional Edwards-Anderson Ising spin glass with bimodal disorder with a fraction of 22.8% antiferromagnetic bonds. Parallel tempering Monte Carlo simulations down to very low temperatures show that for this fraction of antiferromagnetic bonds the phase diagram of the system is reentrant, in agreement with previous results. Furthemore, using a clustering analysis, we analyze the ultrametric properties of phase space for this model.

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