Critical nonequilibrium relaxation in cluster algorithms using the Binder ratio and its application to bond-diluted Ising models\textsuperscript{1} YOSHIHIKO NONOMURA, MANA, National Institute for Materials Science, YUSUKE TOMITA, College of Engineering, Shibaura Institute of Technology — Recently we showed that the critical nonequilibrium relaxation in cluster algorithms is widely described by the stretched-exponential relaxation [1-3]. Explicitly, the absolute value of magnetization at the critical temperature $T_c$ behaves as $\langle |m| \rangle \sim \exp(+cm^\sigma)$ from the perfectly-disordered state. In the present talk we apply this scheme to the bond-diluted Ising models and show that the exponent $\sigma$ increases continuously and monotonously as the bond density $p$ decreases. Although naïve fitting of physical quantities becomes difficult as $p$ approaches the percolation threshold $p_c$, we find that the Binder ratio has no such a problem even in the vicinity of $p_c$. While the Binder ratio is almost independent of system sizes at $T_c$ both at the onset of relaxation and near equilibrium, the exponent $\sigma$ can be estimated accurately by an empirical logarithmic scaling for the size dependence in the intermediate simulation-time region.

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