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Bond-diluted Heisenberg spin systems on coupled ladders DAOXIN YAO, ANDERS W. SANDVIK, A.H. CASTRO NETO, DAVID K. CAMPBELL, Department of Physics, Boston University, MA 02215 — We study spin-1/2 Heisenberg spin systems with bond dilution on coupled ladders or striped phases. The diluted bond configurations can be static or dynamic. The dynamic case with motion of the bonds is described by pseudo-spins and modeled by anisotropic Heisenberg spin chains in an external field. The systems are studied using the stochastic series expansion quantum Monte Carlo method. We find the quantum critical point for real spins from the ordered phase to the disordered phase is sensitive to the bond configuration. A study of the ground state energy shows strong differences for different bond configurations, which may be related to phase separation. Under certain conditions, real spin systems with bond-dilution can be described by a coupling-weakened fully coupled spin systems. For the pseudo-spins, an effective field induced by the real spins is observed.

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