Universality Classes of Dimerized Bond-Disordered Quantum Spin Models JONAS GUSTAFSSON, Goldman Sachs, DAOXIN YAO, ERICA CARLSON, Purdue University, ANDERS SANDVIK, Boston University — We study the dimerized bond disordered S=1/2 Heisenberg models on the square lattice. Each spin belongs to one strong bond (a dimer) by introducing strong and weak couplings, J_s, J_w. By means of quantum Monte Carlo simulations, we find two different universality classes for the random dimer model and the random plaquette model. The change of universality class may be associated with the cancellation of Berry phase. Furthermore, we study the dilution effect by setting some strong bonds to 0.

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