Algorithms and long-range order in the two-dimensional +/-J spin glass[1] A. ALAN MIDDLETON, Syracuse University, CREIGHTON K. THOMAS, Northwestern University, DAVID A. HUSE, Princeton University — Numerical methods and results of their application to the two-dimensional Ising spin glasses will be described. For a random mix of ferromagnetic and antiferromagnetic bonds of equal strength, long range correlations at zero-temperature are derived from scaling relations between computed exponents and are confirmed in numerical simulations. This long range order is stabilized by large entropy differences, as large domain walls often have zero energy cost. The order resembles that in higher-dimensional models at finite temperature. A publically distributed implementation of the algorithms has been developed for computing partition functions and exactly sampling configurations according to their Boltzmann weight for the general spin-glass and related two-dimensional models.

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