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Three-sublattice order in the SU(3) Heisenberg model on the square and triangular lattice BELA BAUER, Theoretische Physik, ETH Zurich, 8093 Zurich, Switzerland and Station Q, Microsoft Research, Santa Barbara, CA 93106, PHILIPPE CORBOZ, Theoretische Physik, ETH Zurich, 8093 Zurich, Switzerland and Institut de theorie des phenomenes physiques, Ecole Polytechnique Federale de Lausanne,, ANDREAS M. LAEUCHLI, Institut fuer Theoretische Physik, Universitaet Innsbruck, Austria and Max-Planck-Institut fuer Physik komplexer Systeme, Dresden, Germany, LAURA MESSIO, Institut de theorie des phenomenes physiques, Ecole Polytechnique Federale de Lausanne, CH-1015 Lausanne, Switzerland, KARLO PENC, Research Institute for Solid State Physics and Optics, H-1525 Budapest, P.O. Box 49, Hungary, MATTHIAS TROYER, Theoretische Physik, ETH Zurich, 8093 Zurich, Switzerland, FREDERIC MILA, Institut de theorie des phenomenes physiques, Ecole Polytechnique Federale de Lausanne, CH-1015 Lausanne, Switzerland — We present a numerical study of the SU(3) Heisenberg model on the triangular and square lattice by means of the density-matrix renormalization group (DMRG) and infinite projected entangled-pair states (iPEPS). For the triangular lattice we confirm that the ground state has a three-sublattice order with a finite ordered moment which is compatible with the result from linear flavor wave theory (LFWT). The same type of order has recently been predicted also for the square lattice. However, for this case the ordered moment cannot be computed with LFWT due to divergent fluctuations. Our numerical study clearly supports this three-sublattice order, with an ordered moment of m=0.2-0.4 in the thermodynamic limit.

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