Quantum phase transitions and dimensional reduction in frustrated magnets

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We discuss phase transitions of quasi-two-dimensional antiferromagnets with a fully frustrated inter-layer interaction. Using symmetry arguments in a perturbation expansion for the order parameter theory and applying the bond-operator method beyond the harmonic approximation, we calculate the magnetic excitation spectrum in different parameter regimes. We consider various crossovers in the vicinity of the quantum critical points and the finite-temperature transitions. We also discuss the relation of our results to recent experiments on $BaCuSi_2O_6$ which indicated the possibility of dimensional reduction through geometric frustration.