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Nota di contenuto	Introduction -- Variational Study of the Square Lattice Anti-ferromagnet Magnetic Zone-Boundary Anomaly -- Modeling the Spin-Wave Dispersion of Insulating Cuprate Materials.
Sommario/riassunto	This thesis presents a qualitative advance in our understanding of quantum effects in layered magnetic materials. The nearest neighbor Heisenberg ferromagnetic ranks among the oldest and most fundamental models of quantum many body effects. It has long been established that in one dimension quantum fluctuations lead to a quantum disordered ground state with fractional excitations called spinons." In two dimensions, the ground state of the Heisenberg model displays static order and to first approximation the dynamics can be

described as semi-classical spin waves. Through theoretical advances the author demonstrates that at high energy around particular points in reciprocal space these semi-classical spin-waves deconfine into fractional excitations akin to the one-dimensional spinons. He thereby provides the first explanation of a long-standing experimental observation. In the second half of his thesis Bastien Dalla Piazza develops a unified description of the magnetic excitation spectra of a range of cuprate parent compounds to the high temperature superconductors.