Vacancy-induced local moment instability of short-range RVB spin liquids on triangular and kagome lattices

Exploiting a connection between monomers of maximum-density dimer packings on the underlying diluted lattice and vacancy-induced local moments in gapped short-range RVB spin liquid states of triangular and kagome lattice antiferromagnets, we argue that weak vacancy disorder leads to a local moment instability on the triangular lattice. Further, the low-dilution regime is characterized by dramatic violations of self-averaging in such diluted triangular lattice antiferromagnets. In contrast, such spin liquid states of kagome lattice antiferromagnets are stable to weak vacancy disorder.

K. Damle, Tata Institute of Fundamental Research Mumbai, India