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Research note

## Formalism of overlaps of valence bond states with any number of triplon

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### Abstract

Resonating valence bond (RVB) states are suitable candidates for ground state of the Heisenberg model on various two dimensional lattices. When a singlet valence bond is broken to produce a triplet state, the resulting excitation is called a triplon. In this paper, we obtain formulas for the overlap and also matrix elements of  $s_i \cdot s_j$  operator between states with arbitrary number of triplons. Our results are valid for any 2D lattice.

**Keywords:** Resonating valence bound, two dimensional lattice, triplon

For full article, refer to the Persian section