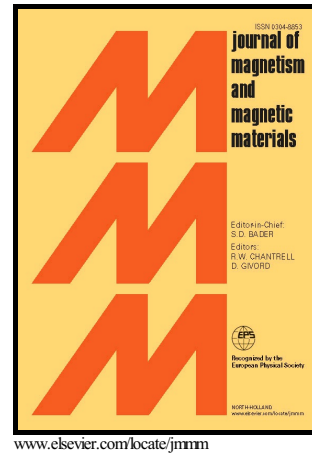


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# Spin superconductivity in the frustrated two-dimensional antiferromagnet in the square lattice

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We use the SU(2) Schwinger boson formalism to study the spin transport in the two-dimensional  $S = 1/2$  frustrated Heisenberg antiferromagnet in a square lattice, considering the second-neighbors interactions in the diagonal. We have obtained a spin superfluid behavior for the spin transport to this system similar to obtained recently to the triangular lattice. We consider an antiferromagnetic inter-chain coupling on the diagonal,  $J_2 > 0$ , and the nearest-neighbor coupling antiferromagnetic  $J_1 > 0$ . We also have in the critical temperature  $T_0$ , where the correlation length  $\xi \rightarrow 0$ , that the system suffers a transition from an ordered ground state to a disordered ground state.

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