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Absolutely continuous spectrum and ballistic behavior for random Schrödinger operators on the Bethe Strip

The Bethe strip is the cross product of the Bethe lattice with a finite set. On this set we consider random Schrödinger operators given by the tensor sum of the Laplacian on the Bethe lattice with a fixed vertical operator plus a random matrix potential with some coupling constant. If the randomness is small enough we find that these operators have purely absolutely continuous spectrum in some energy interval with probability one and moreover, the spreading of wave packets under the quantum evolution is ballistic. The proof uses supersymmetric integral expressions for the matrix Green's functions.