

Abstract Submitted
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Semiclassical Analysis of the Wigner 9J-Symbol with Small and Large Angular Momenta LIANG YU, ROBERT LITTLEJOHN — We derive a new asymptotic formula for the Wigner $9j$ -symbol, in the limit of one small and eight large angular momenta, using a novel gauge-invariant factorization for the asymptotic solution of a set of coupled wave equations. Our factorization eliminates the geometric phases completely, using gauge-invariant non-canonical coordinates, parallel transports of spinors, and quantum rotation matrices. Our derivation generalizes to higher $3nj$ -symbols. We display without proof some new asymptotic formulas for the $12j$ -symbol and the $15j$ -symbol in the appendices. This work contributes a new asymptotic formula of the Wigner $9j$ -symbol to the quantum theory of angular momentum, and serves as an example of a new general method for deriving asymptotic formulas for $3nj$ -symbols.

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