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Evidence for a new $SU(4)$ symmetry with $J=2$ mesons

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Recently, a new $SU(4)$ symmetry has been established, which appears after removing the quasi-zero modes from the Overlap Dirac operator. Namely, the $\rho, \rho', \omega, \omega', a_1, b_1$ and possibly f_1 $J = 1$ mesons become mass degenerate after the quasi-zero mode removal. The $SU(4)$ symmetry contains $SU(2)_L \times SU(2)_R \times U(1)_A$ as a subgroup and predicts, among other things, that all isovector states of given spin J become mass degenerate. Here we study isovector $J = 2$ mesons and observe the degeneracy of all states after removing the quasi-zero modes. This result gives evidence that the $SU(4)$ symmetry is present for mesons of total spin $J \geq 1$.

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