



Contribution ID: 62

Type: **Talk**

## Angular and chiral content of the $\rho$ and $\rho'$ mesons

*Tuesday 26 July 2016 15:00 (20 minutes)*

We identify the chiral and angular momentum content of the leading quark-antiquark Fock component for the  $\rho(770)$  and  $\rho(1450)$  mesons using a two-flavor lattice simulation with dynamical Overlap Dirac fermions. We extract this information from the overlap factors of two interpolating fields with different chiral structure and from the unitary transformation between chiral and angular momentum basis. For the chiral content of the mesons we find that the  $\rho(770)$  slightly favors the  $(1, 0) \oplus (0, 1)$  chiral representation and the  $\rho(1450)$  slightly favors the  $(1/2, 1/2)_b$  chiral representation. In the angular momentum basis the  $\rho(770)$  is then a  $^3S_1$  state, in accordance with the quark model. The  $\rho(1450)$  is a  $^3D_1$  state, showing that the quark model wrongly assumes the  $\rho(1450)$  to be a radial excitation of the  $\rho(770)$ .

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**Session Classification:** Hadron Spectroscopy and Interactions

**Track Classification:** Hadron Spectroscopy and Interactions