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The singlet, triplet and octet axial-vector form factors of the decuplet baryons in the chiral quark constituent model

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The axial-vector form factors of the decuplet baryons are investigated in the chiral constituent quark model using their explicit quark spin polarizations. The quark sea” arises from the chiral symmetry breaking which results in the Goldstone bosons mediating the interaction between constituent quarks. The axial-vector form factors which have some physical significance corresponding to the flavor singlet current, flavor isovector (triplet) current and the flavor hypercharge axial (octet) current at zero momentum transfer are respectively $G_{AV, B^* \frac{3}{2}}^0(0)$, $G_{AV, B^* \frac{3}{2}}^3(0)$ and $G_{AV, B^* \frac{3}{2}}^8(0)$. In order to further understand the Q^2 dependence of these form factors, we have used the dipole form of parametrization. The qualitative and quantitative contribution of the quark sea” has also been investigated by varying the transition probability of the chiral fluctuation.

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