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Magnetic moment of $\Lambda(1405)$ as a S-shell pentaquark TAKASHI INOUE, Dept. Phys. Sophia University — Many theoretical interpretations have been given for exotic baryons, Θ^+ and Ξ^{--} in various scenarios: chiral quark soliton, hadron bound state, valence pentaquark and so on. The simplest pentaquark model is the S-shell pentaquarks where all quarks and an anti-quark are in the ground S-wave state. There is an experimental indication of the Θ^+ being iso- scalar. If we take this indication into S-shell pentaquarks, the Θ^+ become a member of flavor SU(3) anti-decuplet with $J^P = 1/2^-$ and $3/2^-$. In this model, there are also accompanying flavor SU(3) octets with $J^P = 1/2^-$ and $3/2^-$. These octets include one Λ hyperon as the ground state octet. The structure of observed $\Lambda(1405)$ with $J^P = 1/2^-$ have been given in scenarios: p-wave excited 3-quark, meson-baryon quasi-bound state and so on. Now, we have one another scenario: a S-shell pentaquark. In this paper, we study $\Lambda(1405)$ in this scenario, especially its magnetic moment. Magnetic moment of the Λ pentaquark is given by $\mu_\Lambda = \sum_{i=1}^{5} \langle\Lambda| \hat{\mu}_i Q_i \sigma_i^3 |\Lambda\rangle$ because all valence particles are in the ground state S-wave orbit. Using the fit to ground state baryons, we obtain $\mu_{\Lambda(1405)} = 0.427\mu_N$. This prediction is in contrast with that of p-wave excited 3- quark model: $\mu_{\Lambda(1405)} = -0.13\mu_N$. It is interesting that the present result agree with the prediction $\mu_{\Lambda(1405)} = +0.25 \sim 0.45\mu_N$ in the meson-baryon resonance approach. It seems natural because both two approaches share five-quark valence contents for the hyperon. Further discussions will be given at the conference.

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