Abstract Submitted
for the HAW05 Meeting of
The American Physical Society

Anisotropic lattice QCD studies of spin 3/2 penta-quark NORIYOSHI ISHII, Department of Physics H-27, Tokyo Institute of Technology, TAKUMI DOI, RIKEN BNL Research Center, YUKIO NEMOTO, Department of Physics, Nagoya Univerisity, MAKOTO OKA, Department of Physics H-27, Tokyo Institute of Technology, HIDEO SUGANUMA, Department of Physics, Kyoto University — Anisotropic lattice QCD results for the penta-quark(5Q) Θ^+ in $J^P = 3/2^{\pm}$ channel are presented for a high-precision mass measurement using a large number of gauge configurations as $N_{\rm conf} = 1000$. The standard Wilson gauge action at $\beta = 5.75$ with the renormalized anisotropy as $a_{\rm s}/a_{\rm t} = 4$, and $O(a)$ improved Wilson (clover) quark action with $\kappa = 0.1210(0.0010)0.1240$ are employed on a $12^3 \times 96$ lattice. Several Rarita-Schwinger interpolating fields with isospin $I = 0$ are examined such as (a) the NK*-type, (b) the (color-)fused NK*-type, (c) a diquark-type. The chiral extrapolation leads to only massive states as $m_{5Q} > 2$ GeV. The analysis with the hybrid BC(HBC) is performed to investigate whether these states are compact 5Q resonances or not. No localized 5Q resonance states are found.

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Date submitted: 25 May 2005 Electronic form version 1.4