Possible chiral bands in ^{194}Tl *

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High spin states in ^{194}Tl, excited through the ^{181}Ta (^{18}O, 5n) heavy-ion fusion evaporation reaction were studied using the AFRODITE array at iThemba LABS. The γ-γ coincidences, DCO ratios and linear polarization measurements were carried out and the previously known level scheme of ^{194}Tl was significantly extended. The yrast band built on the 8^- isomeric state has the $\pi h_{9/2} \otimes \nu i_{13/2}^{-1}$ configuration suitable for a chiral system. One of the new bands built on the 10^- level has the same parity and close excitation energy to that of the yrast band [1]. This band is linked to the yrast band by several M1/E2 transitions which indicates similar configuration. These negative parity bands were observed through a band crossing caused by the excitation of a $\nu i_{13/2}$ pair. Above the band crossing the excitation energies of these 2 bands remain close, suggesting that chirality may persist for the 4qp configuration too. In addition, these bands have very similar properties such as quasiparticle alignments, moments of inertia, B(M1)/B(E2) reduced transition probabilities especially above the band crossing and the same band crossing frequencies. They however have different energy staggering patterns. Particle-rotor model, in which two and four particles are coupled to a triaxial core with and without residual proton-neutron interaction included was employed for the negative parity bands. In this contribution the results of the gamma spectroscopy, the theoretical calculations and the possibility of these bands being chiral will be discussed.

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