



Contribution ID: 265

Type: Oral Presentation

Search for chirality in ^{193}Tl

Tuesday, 9 July 2013 14:50 (20 minutes)

Abstract content
 (Max 300 words)

Chirality refers to an object or a system which is not identical to its mirror image and was proposed in atomic nuclei by Fauendorf and Meng. Nuclear chiral system is a triaxially deformed odd-odd nucleus where the collective rotational angular momentum favors alignment along the intermediate axis, while the odd proton and odd neutron (having particle and hole nature respectively), favor alignments along the nuclear short and long axes respectively. In the laboratory reference frame, a doublet $\Delta I = 1$ bands with similar excitation energy levels and the same spins and parities are observed. Some chiral doublet bands were suggested in different mass regions and it was revealed at iThemba LABS that the Tl isotopes form a new region where chiral symmetry could develop. It was recently shown that ^{194}Tl could perhaps be the best chiral candidate up to date. ^{193}Tl as a neighbor of ^{194}Tl is thus likely to be a very good chiral candidate. In order to extend the chirality studies in the 190 mass region and to continue the search for a pair of bands that fulfill all fingerprints of chirality, an experiment was performed at iThemba LABS to investigate the excited states in ^{193}Tl using the $^{160}\text{Gd}(^{37}\text{Cl},4n)$ reaction. The analysis to extend the level scheme, and to determine the spins and parities is in progress. We will present the results obtained so far.

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Session Classification: NPRP

Track Classification: Track B - Nuclear, Particle and Radiation Physics