EVIDENCE FOR A NEW REGION OF CHIRALITY AROUND A∼104

P. Joshi[1], D. G. Jenkins[1], P. M. Raddon[1], A. J. Simons[1], R. Wadsworth[1], A. R. Wilkinson[1], D. B. Fossan[2], T. Koike[2], K. Starosta[2,3], C. Vaman[2], J. Timár[4], A. Algora[4,5], Zs. Dombrádi[4], A. Krasznahorkay[4], J. Molnár[4], D. Sohler[4], L. Zolnai[4], E. S. Paul[6], G. Rainovski[6], A. Gizon[7], J. Gizon[7], P. Bednarczyk[8], D. Curien[8], G. Duchene[8] and J. N. Scheurer[9]

1. Department of Physics, University of York, York, YO10 5DD, UK
2. Department of Physics and Astronomy, SUNY, Stony Brook, New York, 11794-3800 USA
3. NSCL, Michigan State University, 164 S. Shaw Lane, East Lansing, MI 48824-1321, USA
4. Institute of Nuclear Research, Pf. 51, 4001 Debrecen, Hungary
5. Instituto de Fisica Corpuscular, CSIC-Univ. Valencia, E-46071, Valencia, Spain
6. Oliver Lodge Laboratory, Department of Physics, University of Liverpool, UK
7. LPSC, 53 avenue des Martyrs, 38026 Grenoble - Cedex, France
8. IReS, 23 rue du Loess, Strasbourg, 67037, France
9. Université de Bordeaux, F-33175, Gradignan Cedex, France

Electronic address: pj9@npg.york.ac.uk

Chirality is now known to exist in atomic nuclei when three angular momentum vectors align themselves along the three different axes of a triaxial nucleus. In odd-odd nuclei two of these vectors arise when the angular momenta of a high-j particle of one type of nucleon and a high-j hole of the opposite type of nucleon are aligned along the short and long axes, respectively, or vice versa. The third vector results from the angular momentum of the collectively rotating core, which points along the intermediate axis. This kind of geometrical arrangement gives rise to two possible systems with opposite handedness, which is manifested in the laboratory reference frame as a pair of chiral doublet bands having the same spins and parities. Such bands have been found in several odd-odd nuclei around the N∼75, A∼130 region. These result from a $\pi h_{11/2} \otimes \nu h^{-1}_{11/2}$ configuration and have been interpreted using models based on the cranked mean-field approach and quasi-particles coupled to a rigid triaxial rotor (e.g., see refs. [1,2]).

Recently the first evidence for similar structures, built upon the $\pi g^{-1}_{9/2} \otimes \nu h_{11/2}$ configuration, has been found in ^{104}Rh [3]. This study has been followed by a series of experiments undertaken by us to investigate the nature and extent of such structures in ^{106}Rh, ^{106,107}Ag and ^{100}Tc. The experiments were carried out using the Euroball, Gammasphere and the Stony Brook arrays, respectively. Pairs of doublet bands, based on the above configuration, have been found in the odd-odd nuclei and the data have been compared with particle-rotor model calculations. The results suggest the presence of a new region of chirality, and hence triaxiality, centered around ^{104}Rh. These new data will be presented, along with the calculations and a discussion on the current limits of their applicability.

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