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Exotic Triaxial Shape and Wobbling Rotational Motion in ^{189}Au ¹ JOSEPH COZZI, NIRUPAMA SENSARMA, UMESH GARG, KEVIN HOWARD, University of Notre Dame — While most nuclei are symmetrically shaped, exotic asymmetric shapes have been observed in the excited nuclear states of heavy mass nuclei. One such asymmetric shape, the triaxial shape, is characterized by three different lengths for each of the three primary axes. Due to the asymmetry in its shape, an excited triaxial nucleus spins irregularly. This non-uniform rotational motion is known as ‘wobble’ and results in the emission of highly mixed electric and magnetic gamma rays as the nucleus transitions from higher to lower rotational energy states. Excited ^{189}Au nuclei were created through a dehydration fusion reaction performed at Argonne National Laboratory. Gammashpere, an array of 110 high purity germanium detectors housed at Argonne, was used to capture the gamma ray decay spectrum from the excited ^{189}Au . This spectrum is being analyzed in order to confirm and expand upon previously published level schemes of ^{189}Au . Directed coefficients of orientated nuclei and angular distributions will be calculated and used to identify the polarity and electromagnetic characteristics of key transitions in the ^{189}Au gamma ray decay spectrum. The level scheme and analysis results from this study on the nuclear shape and rotational motion of ^{189}Au will be presented.

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