Fragmentation of the Low Energy Octupole State in ^{192}Os ◇

P. D. Cottle [a], N. V. Zamfir [b,c,d,e], R. F. Casten [b,c], S. Deylitz, A. Gollwitzer, G. Graw, R. Hertenberger, B. D. Valnion, Gh. Cata-Danil [e], and A. M. Oros [f,e]
[a] Florida State University, Tallahassee, FL 32306, USA
[b] Brookhaven National Laboratory, Upton, NY 11973, USA
[c] WNSL, Yale University, New Haven, CT 06511, USA
[d] Clark University, Worcester, MA, 01610, USA
[e] Institute of Atomic Physics, Bucharest Magurele, Romania
[f] Institut für Kernphysik, Universität zu Köln, Germany

1. Introduction

The large fragmentation of the low energy octupole state (LEOS) that occurs in ^{194}Pt, ^{196}Pt, and ^{198}Pt [1] has now been explained as a consequence of the O(6) symmetry which is present in these nuclei [2]. It has also been predicted [2] that significant fragmentation of the LEOS would occur in the transition region between the O(6) Pt isotopes and the well deformed near-SU(3) rare earth nuclei.

2. Experimental results

The ^{192}Os(p,p') reaction was studied with 22 MeV protons at the Munich Tandem van de Graaff accelerator with the QDDD spectrograph and the high resolution focal plane detector. Data were measured at five angles.

The proton spectrum in the 1000-3000 keV energy range (Fig. 1) shows several peaks which have intensities comparable to or greater than that of the lowest 3^- state at 1341 keV. Of the four largest peaks at 1779, 1928, 2083 and 2579 keV, three (1928, 2083 and 2579 keV) have angular distributions which are consistent with a 3^- spin-parity assignment (the 1779 keV state is the lowest 5^-- state in this nucleus).

3. Conclusion

If these three states are indeed 3^- states, then the large fragmentation predicted in [2] is confirmed.
A ^{192}Os(d,d') measurement is planned to confirm the spin assignments for the peaks observed in (p,p').

References

[1] P.D. Cottle, K.A. Stuckey, and K.W. Kemper, Phys. Rev. **C38** (1988) 2843
[2] N.V. Zamfir, P.D. Cottle, J.L. Johnson, and R.F. Casten, Phys. Rev. **C48** (1993) 1745

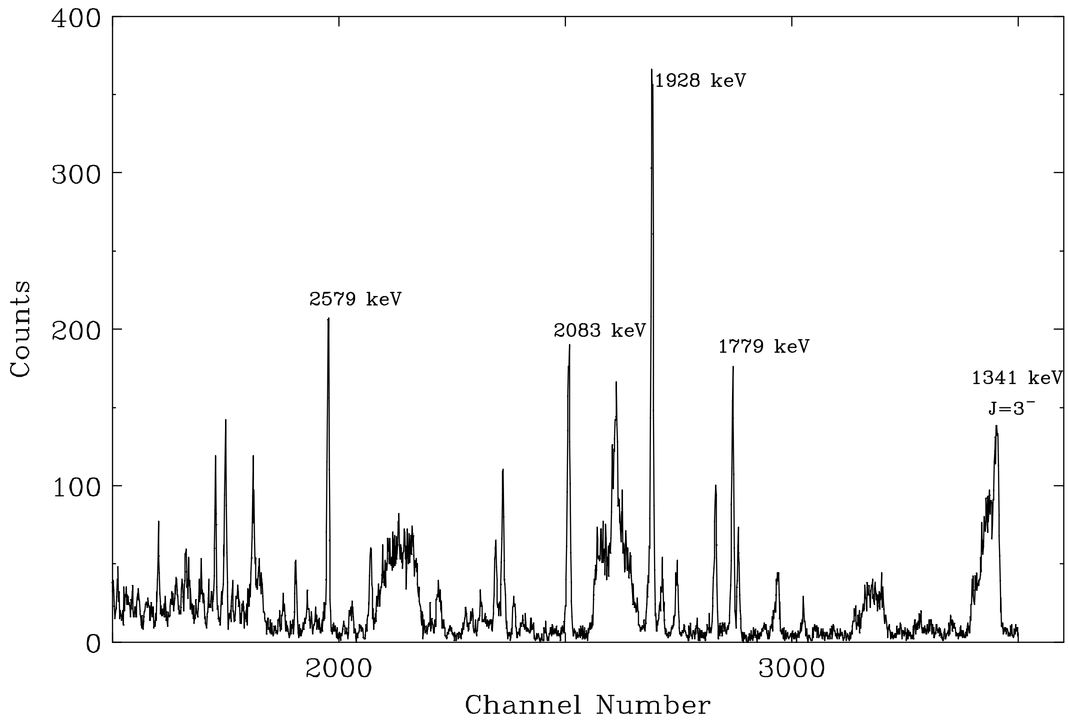

Fig. 1: Spectrum of scattered protons in the 1000-3000 keV excitation energy range taken at 35 °

◇Work supported in Part by the DFG under IIC4-Gr 894/2 and by the US DOE under contract DE-FG02-91ER40609 and DE-AC02-76CH00016 and by US NSF