Multiple Band Structures in $^{131}$Nd and $^{130}$Nd.\textsuperscript{1} W. RE-VIOL, H.Q. JIN, L.L. RIEDINGER, B.H. SMITH, N.P. YODER, University of Tennessee, A. GALINDO-URIBARRI, Oak Ridge National Laboratory, D.G. SARANTITIES, D. LAFOSSE, J.N. WILSON, Washington University, S.M. MULLINS, Australian National University —

Rotational bands have been assigned to the neutron-deficient nuclei $^{130,131}$Nd through the analysis of a Gammasphere plus Microball experiment at Berkeley, using the $^{40}\text{Ca}$ on $^{94}\text{Mo}$ reaction at 180 MeV. Whereas we have analyzed the exit channels with 3 protons leading to light Pr isotopes, here we report on the results for the 2p gated gamma-ray data, which are dominated by $^{130,131}$Nd. The new level scheme for $^{131}$Nd consists of four bands, significantly extending the earlier data\textsuperscript{2}, which we assign to the $7/2^+[523]$, $5/2^+[402]$, $1/2^+[411]$, and perhaps $1/2^+[541]$ neutron configurations. The observed signature splitting in the last one is much smaller than expected for a $1/2^+[541]$ orbital. Calculations to address this issue will be presented. In addition to the yrast band of $^{130}$Nd,\textsuperscript{3} we assign bands built on the high and low $K$ couplings of the $7/2^+[523]$ and $5/2^+[402]$ orbitals, the $\gamma$-vibrational band and one other sequence. Besides these normal-deformed bands, we also observe one band of enhanced or super deformation in each case.

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\textsuperscript{2}D. Watson, University of Liverpool Annual Report (1987/88).

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