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**Identification of band structures and proposed one- and two-phonon $\gamma$ -vibrational bands in $^{105}$Mo** H.B. DING, S.J. ZHU, Tsinghua Univ., J.H. HAMILTON, A.V. RAMAYYA, J.K. HWANG, K. LI, Vanderbilt Univ., Y.X. LUO, Vanderbilt Univ./LBNL, J.O. RASMUSSEN, I.Y. LEE, LBNL, C.T. GOODIN, Vanderbilt Univ., X.L. CHE, Y.J. CHEN, M.L. LI, Tsinghua Univ. — High spin band structures in neutron-rich $^{105}$Mo were studied by measuring prompt $\gamma$-rays emitted by the spontaneous fission fragments of $^{252}$Cf with the Gammasphere detector array. The yrast band has been confirmed and five new collective bands are observed. The three bands based on the 246.3, 332.0 and 310.0 keV levels are proposed as the single-neutron excitation bands built on the $3/2^+[411]$, $1/2^+[411]$ and $5/2^+[413]$ Nilsson orbitals, respectively. The other two bands with band head levels at 870.5 and 1534.6 keV are candidates for one-phonon K=9/2 and two-phonon K=13/2 $\gamma$-vibrational bands, respectively. Systematic comparison of these bands with bands in $^{104,106}$Mo are discussed.

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