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The covering SU(3) group over anisotropic harmonic oscillators KAZUKO SUGAWARA-TANABE, Otsuma Women's University, Tama, Tokyo 206-8540, KOSAI TANABE, RIKEN, Nishina Center, Saitama 351-0198, AKITO ARIMA, Science Museum, Japan Science Foundation, Tokyo 102-0091, BRUNO GRUBER, Southern Illinois University, Carbondale, Il 62901 — We propose new non-linear boson transformation by which all the anisotropic oscillator states can be embedded in the SU(3) bases. We start from the oscillator Hamiltonian without spin- orbit interaction, and suppose that three oscillator frequencies have an integral rational ratio $a : b : c$. In order to construct a SU(3)-invariant expression, we express the harmonic oscillator boson operator c_k $(k = x, y, z)$, in terms of a m-fold product of new bosons s_m $(m = a, b, c)$, by requiring $s^\dagger_m s_m = mc^\dagger_k c_k$. The general form of the new bosons s_m, for any positive integer m, is given by $c_k = [m \prod_{r=1}^{m-1}(\hat{n}_m + r)]^{-1/2}(s_m)^m$, with $\hat{n}_m = s^\dagger_m s_m$. Applying the analogy of Elliott's group operators, we obtain a similar set of group operators from new bosons s_a, s_b and s_c, i.e., $\tilde{Q}_q$ for $q = 0, \pm 1$ and ± 2, and $\tilde{\ell}_k$ for $k = a, b$ and c. Then, the commutation relations among these 8 operators are closed, and they commute with H. Together with Casimir operator and two operators which have diagonal form in number operators, i.e., $\tilde{Q}_0$, and $\tilde{Q}_2 + \tilde{Q}_{-2}$, we can classify the single-particle states in N_{sh}, and find the new magic numbers for the triaxially deformed field.

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