II-4 RESULTS AND DISCUSSION

The calculation are carried out for nuclei in actinide and rare earth regions, But one discuss only the nuclei $Yb^{168}, Er^{166}, Dy^{164}$ which lie in the rare earth region, **N=98** and $U^{232}, U^{236}, U^{236}$ and U^{238} (in actinides region ,Z=92). However, in most rare earth nuclei, due to the crossing of the ground rotational band (GRB) by S-band at $I^{\pi} \sim 10^{+} - 12^{+}$, usually only 4-5 Yrast levels ($I \leq 10$) belong to GRB. This clearly limits the applicability of the Harris model to the GRB. In recent years, coulomb excitation experiments with very high ion beams on the actinide nuclei have provided abundant information about the high spin levels of actinide GRB's. Because the moment of inertia of actinide nuclei are about twice those of the rare earth nuclei ,the two quasi-particle S band dose not compete with GRB until much higher spins. Therefore , the Yrast levels with even spin and parity in actinide nuclei may belong to the GRB's with much higher spins than those in the rare earth nuclei . According to the previous discussions ,we have calculated the rotational spectrum for the ground state band up to $I^{\pi} = 10^{+}$ for the chosen nuclei in the rare earth region, while up to $I^{\pi} = 16^{+}$ for the chosen $U^{232-238}$ isotopes.

The calculated energies for the chosen nuclei are presented in Table 1. In this table, the first and second columns contain the angular momentum and experimental energies . The last row represents the average deviation of the predicted energies from the experimental ones. The third, the fourth and the fifth columns contain the present predicted energies for various models, iterative solution of Harris equation Eq.(7) ,Sood model Eq.(21), and two parameter expression Eq.(11) respectively. The last two columns contain the experimental moment of inertia parameter and the corresponding predicted values according to Eq.(8) The parameters used in the calculation of Eq.(7) and Eq.(8) are listed in table (2) " $\Im_o$ and C".

In the Sood model Eq.(21), extracting the ratio $R_4 = E(4) / E(2)$ from the experimental data, one can determine a reasonable value for the parameter **B/A**. Then, the value of the parameter **A** is determined from the experimental value of E(4) or E(2). Consequently , the ground band spectrum E(I) can be predicted for Yb^{168},Er^{166},and Dy^{164} "sample isotones in rare earth region " and $U^{232,234,236,238}$ "sample isotopes in actinide region" The comparison of our calculations and the experimental data for typical nuclei is given in Table 1. The calculations using the two parameter expression, Eq.(11), are carried out in a similar manner as for the Sood model. The parameters **a** and **b** are listed in Table 2, and the predicted energies presented in fifth column in Table 1.

From Table 2 one notices that the values of **2/ab** and $\Im_o$ are nearly equal which manifests that the Harris model is approximately equivalent to the two parameter formula Eq.(11). Also by comparing the mean deviations of the corresponding experimental data for various models it is clear that the two parameter formula is the best one .

In general, the predicted values for different models are in good agreement with the experimental data.