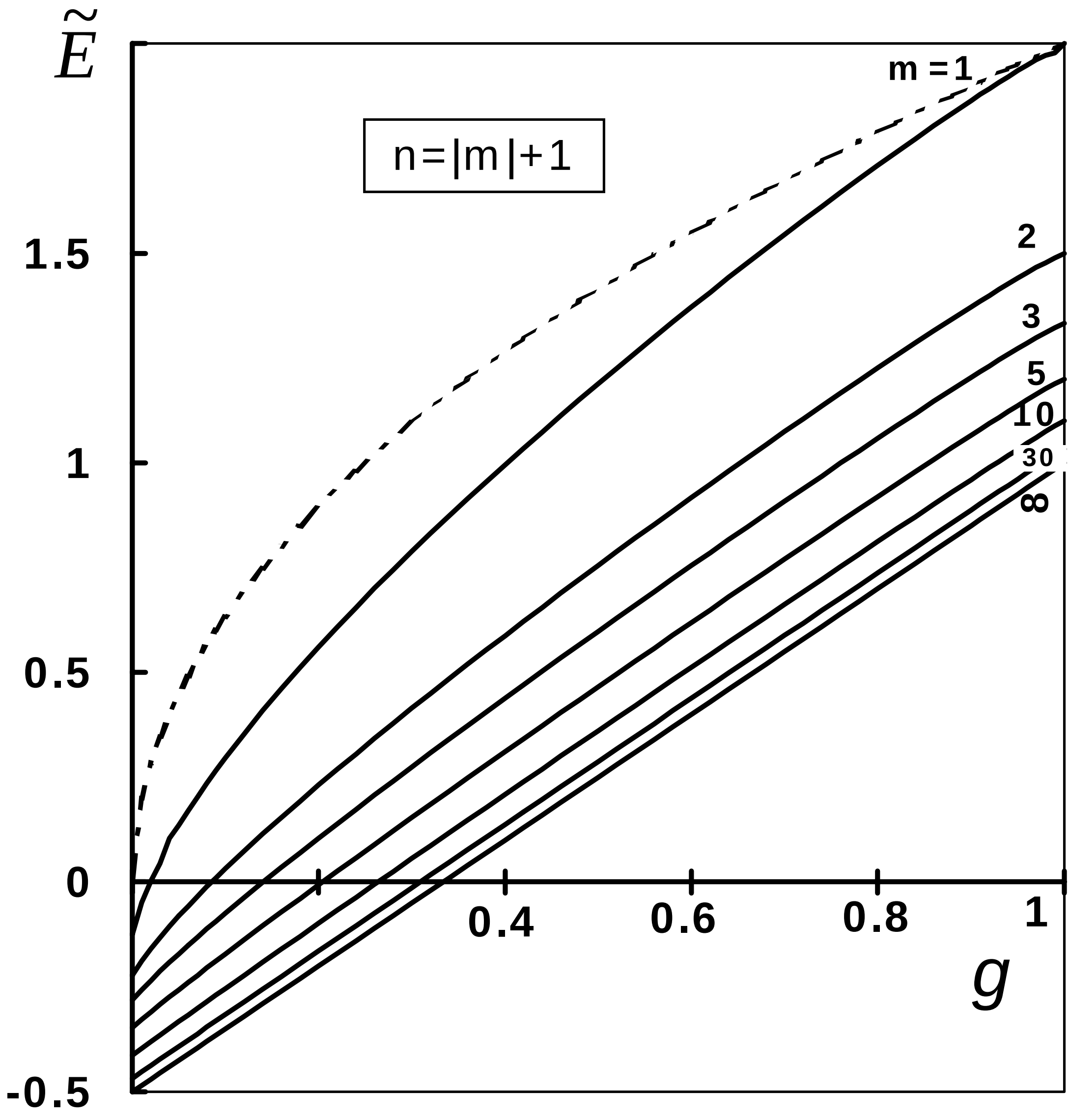

Figure 1. The dependence of the scaled energy $\tilde{E}$ on the coupling parameter g for $n = |m| + 1$ states corresponding to the ground state of the oscillator ($n_1 = n_2 = 0$). $\tilde{E}$ is the eigenenergy of the Schrödinger equation with the effective potential

$$\tilde{V}_{\rm eff}(\tilde{\rho},\tilde{z}) = \frac{1}{2\tilde{\rho}^2} - \frac{1-g}{\tilde{r}} + \frac{g}{2}\tilde{\rho}^2$$

in which $1/m$ plays the role of the Planck's constant. Chain curve is the ionization threshold shown for $m = 1$.

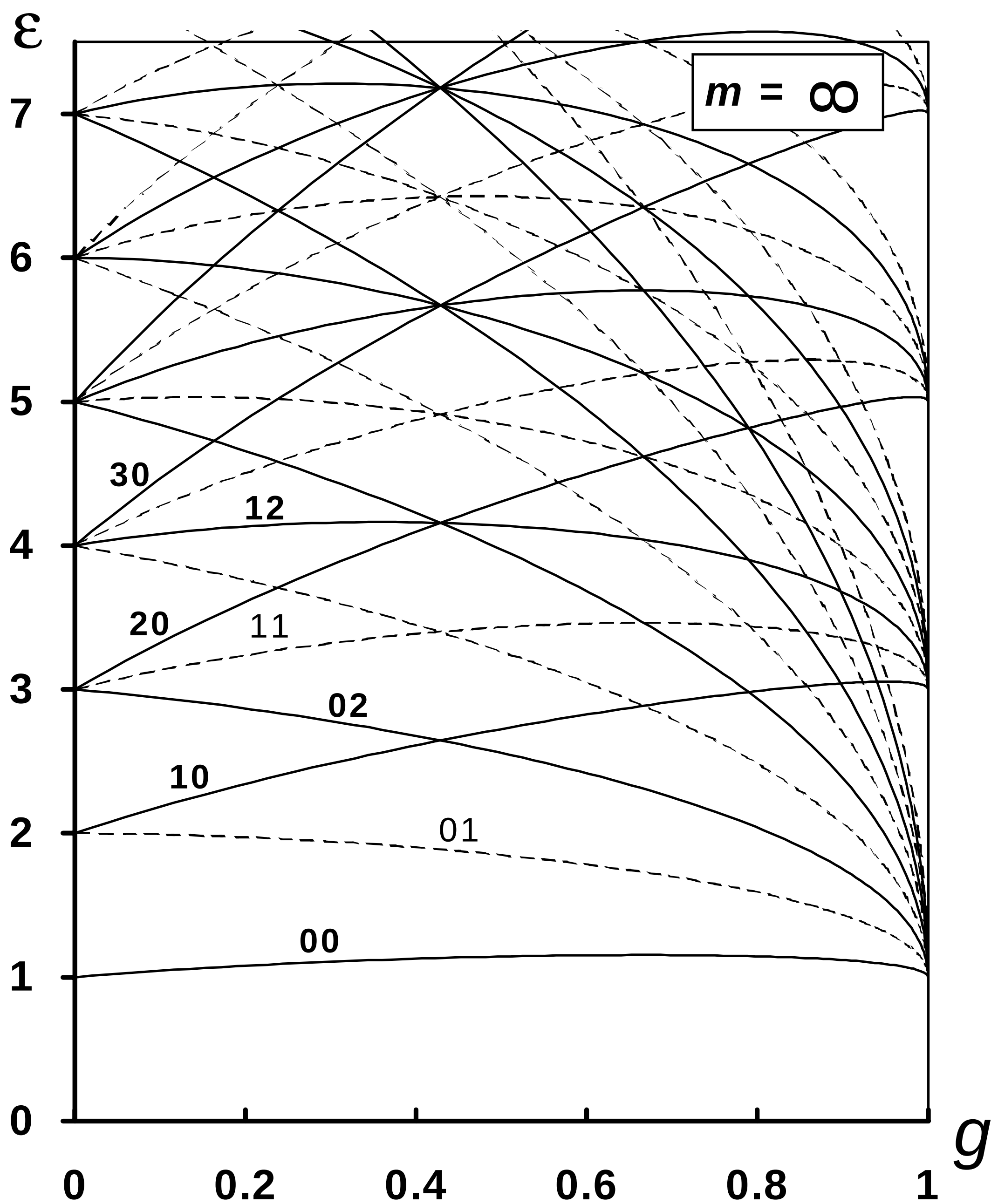

Figure 2. The vibrational part of the energy of the even parity states (solid lines) and odd parity states (dashed lines) in the large *m* limit $\varepsilon(g) = (n_1 + 1/2)\sqrt{1+3g} + (n_2 + 1/2)\sqrt{1-g}$ (total scaled energy is $\widetilde{E}(g) = -\frac{1}{2} + \frac{3}{2}g + \varepsilon(g)m^{-1}$). The curves are labeled by harmonic oscillator quantum numbers n_1, n_2.

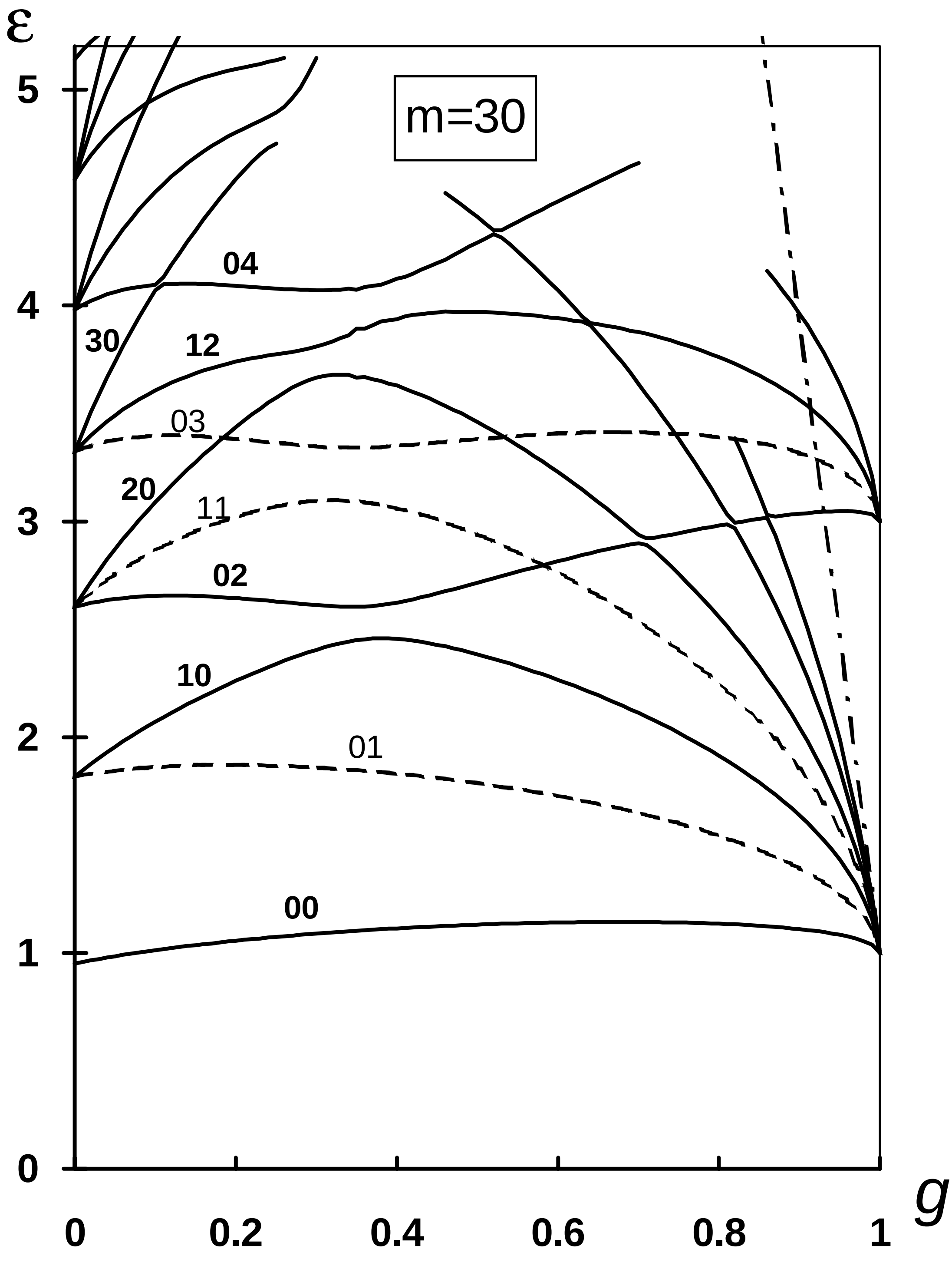

Figure 3. The vibrational part of the energy levels in $m = 30$ azimuthal subspace obtained by summation of $1/m$-expansion. The ionization threshold is shown by chain line.

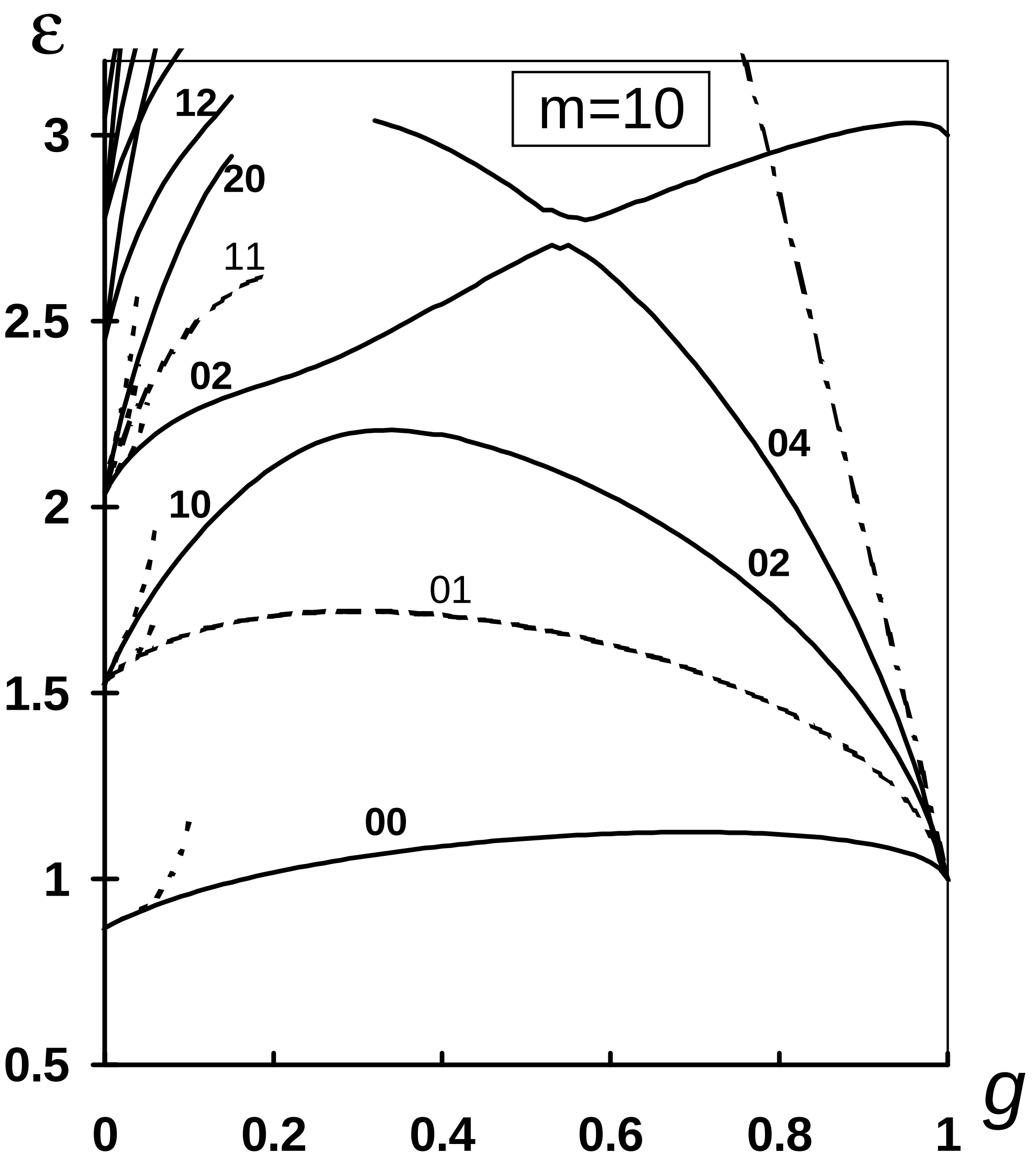

Figure 4. Similar to figure 3 but for $m = 10$ subspace. The results of the standard perturbation theory are shown by dotted lines.