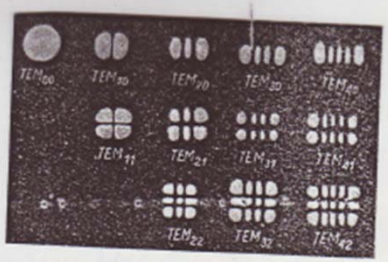
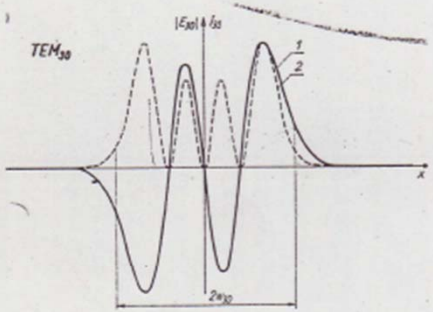
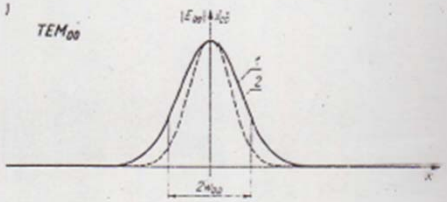
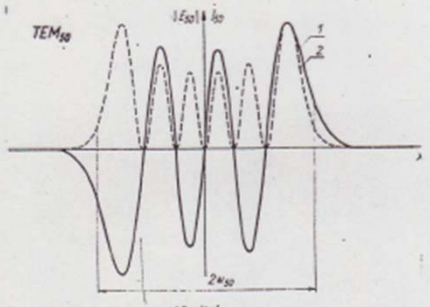
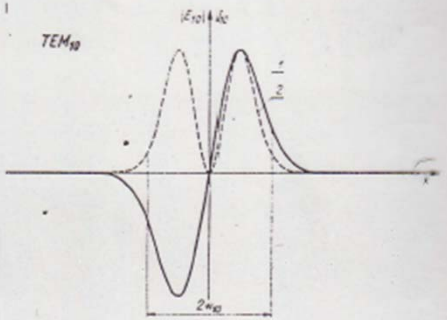
$$E_{mn\Lambda} = E^0_{mn\Lambda}\frac{w_0}{w}H_m\left(\sqrt{2}\frac{x}{w}\right)H_n\left(\sqrt{2}\frac{y}{w}\right)\exp\left[-\left(\frac{r}{w}\right)^2\right]\exp\left\{-i\left[kz-\frac{kr^2}{2R}-(m+n+1)\Phi\right]\right\}$$

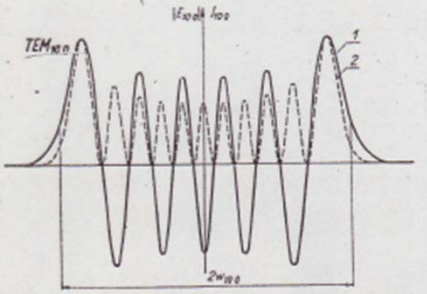


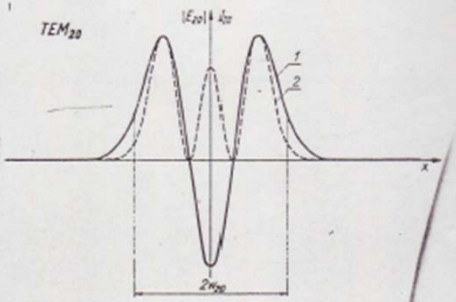






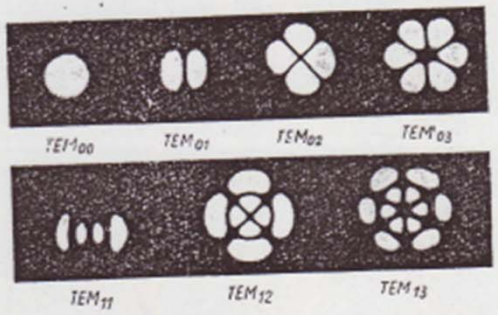


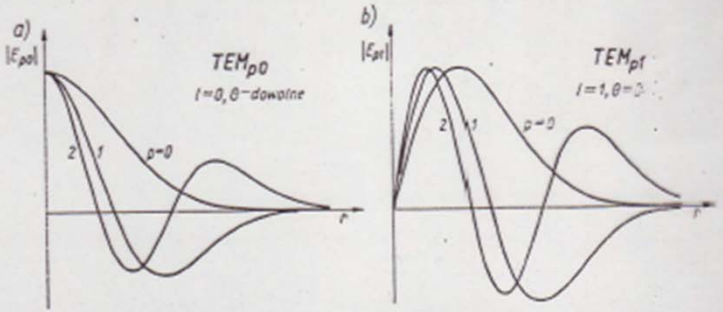


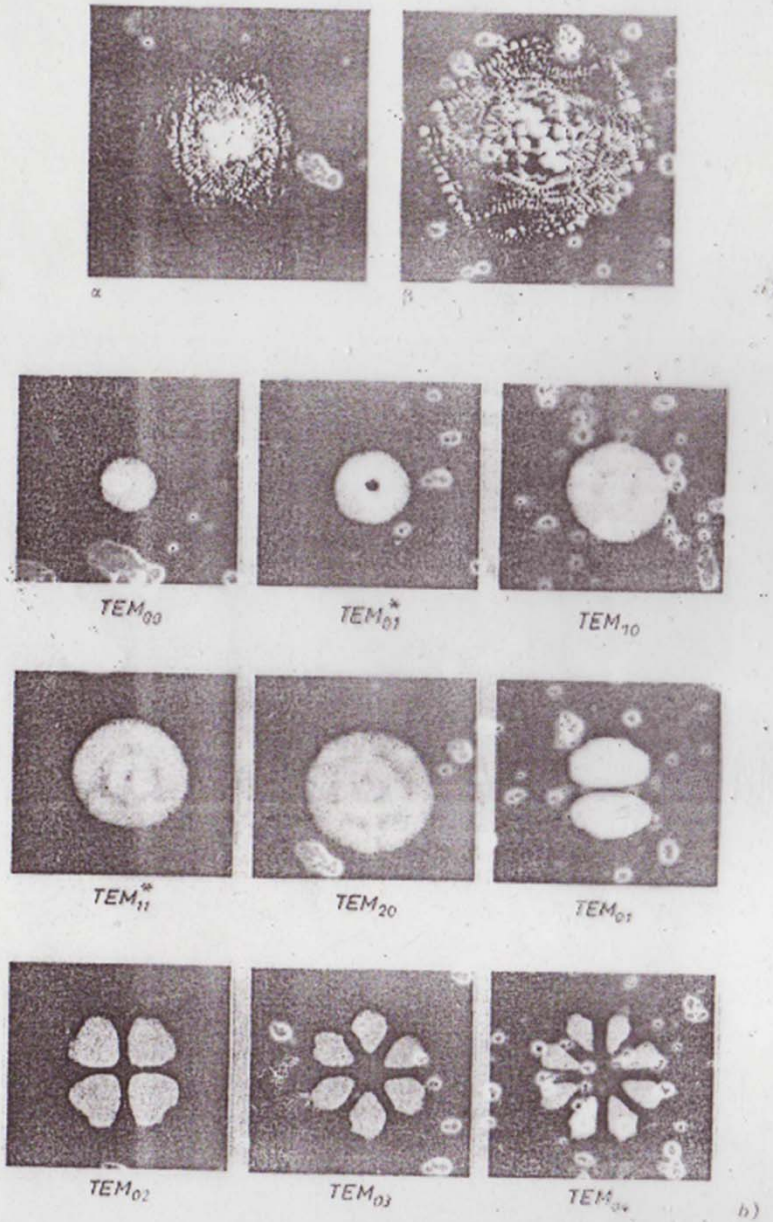


$$E_{pl}(r,\ 0,\ z) = E_{pl}^{0}\,\frac{w_0}{w}\left(\sqrt{2}\,\frac{r}{w}\right)^{l} L_p^{l}\left[\left(\sqrt{2}\,\frac{r}{w}\right)^{2}\right]\cos(l\theta)\exp\left[-\left(\frac{r}{w}\right)^{2}\right]\times$$

$$\times\exp\left\{-i\left[kz-\frac{kr^2}{2R}-(2p+l+1)\Phi\right]\right\}$$







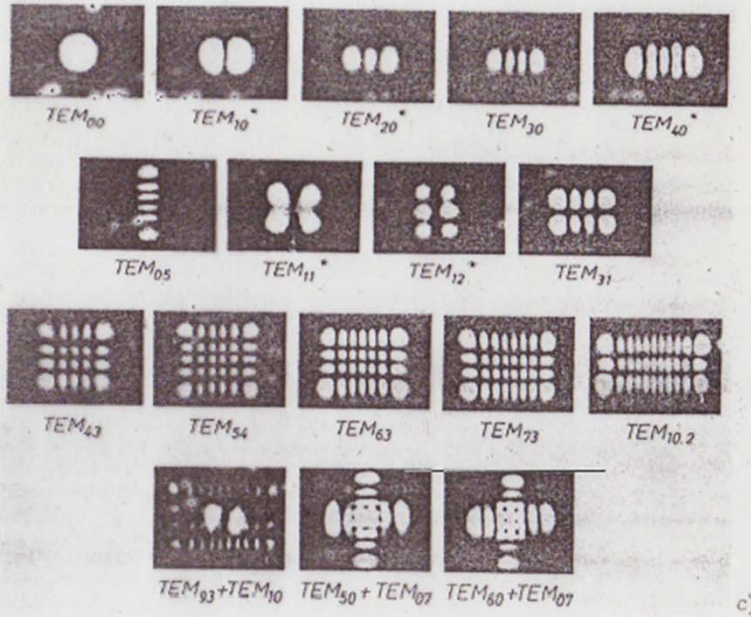


Fig. 9.31. Modes of general confocal resonators (He-Ne for $\lambda = 1{\cdot}153\ \mu$).
(a) $r = l$, $a^2/l\lambda \gg 1$; without additional mode selection; (α) Near field (β) Far field [1516]. A large number of transverse modes is excited simultaneously. (b) Pure modes in r, ϕ symmetry [3243]; $r/l = 1{\cdot}5$. The modes were selected by adjusting a circular diaphragm in the resonator. Because of the non-linear line-saturation a mode of the highest possible order always oscillates. The modes marked by asterisks are super-positions of degenerate modes. (c) Pure modes in x, y, symmetry [3309] $r > l$. The modes were selected by means of diaphragms in the resonator. The selection of x, y modes is maintained by the astigmatism of the Brewster windows. The photographs marked by asterisks are super-positions of modes.

FREKVENCE - "VYŠŠÍ MÓDY"

OSA : $\phi_s(z) = s \operatorname{arctg}\left(\frac{z}{b}\right)$

$s = l + m + 1$ □

$s = 2p + l + 1$ ○

PODMÍNKA

$$kL - s \arccos\sqrt{g_1 g_2} = n\pi$$

$$\nu = \frac{c}{2L}\left(n + s\,\frac{\arccos\sqrt{g_1 g_2}}{\pi}\right)$$