

16.1. Излучение Е-плоскостного секториального рупора.

$$E_{\varphi}(\Theta) = \frac{\pi^2}{8} (1 + \text{Cos}\Theta) \frac{\text{Cos}(0.5ka_p \text{Sin}\Theta)}{\left(\frac{\pi}{2}\right)^2 - (0.5ka_p \text{Sin}\Theta)^2} \quad (16.1)$$

в Н-плоскости.



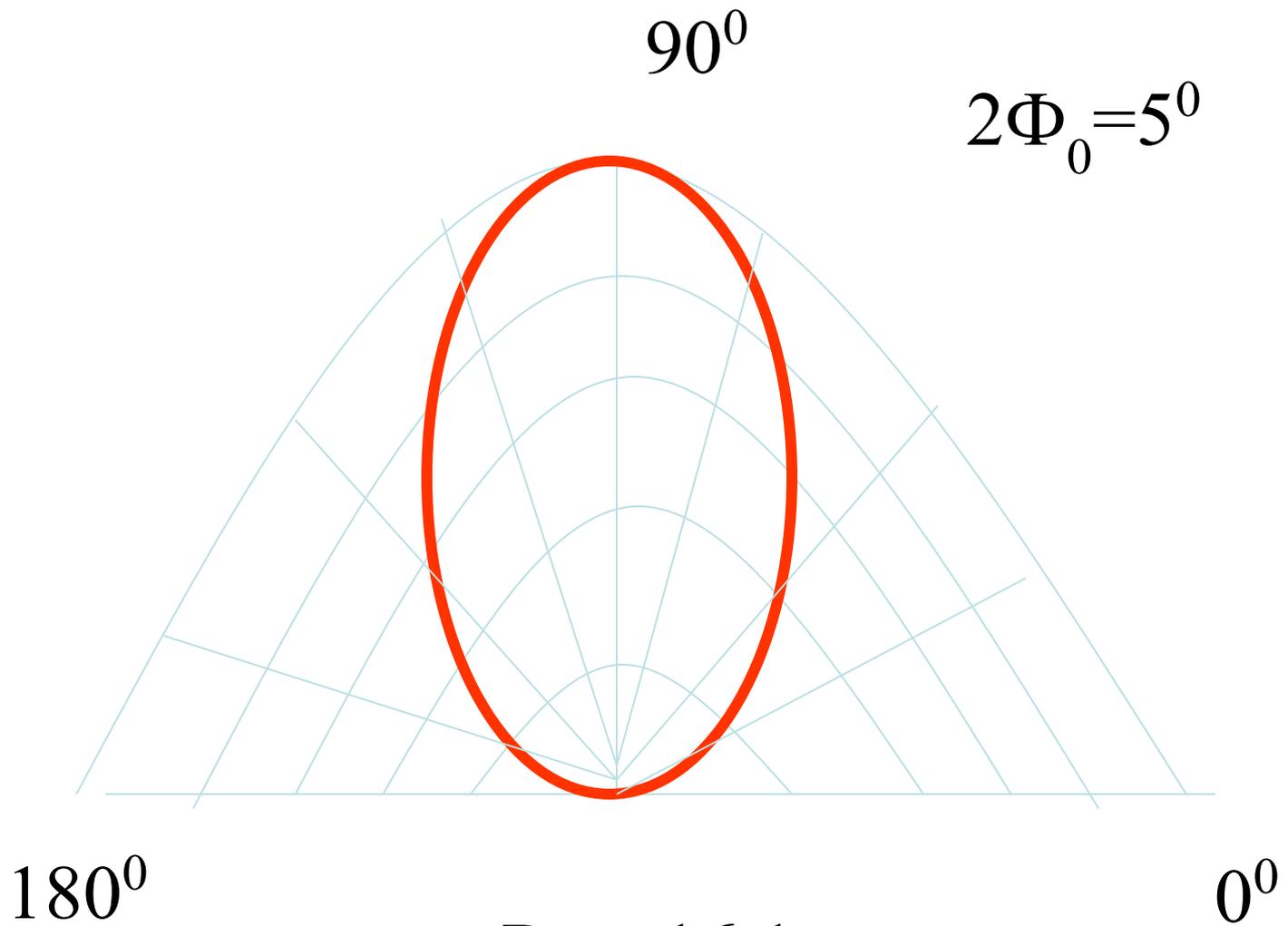


Рис. 16.1.



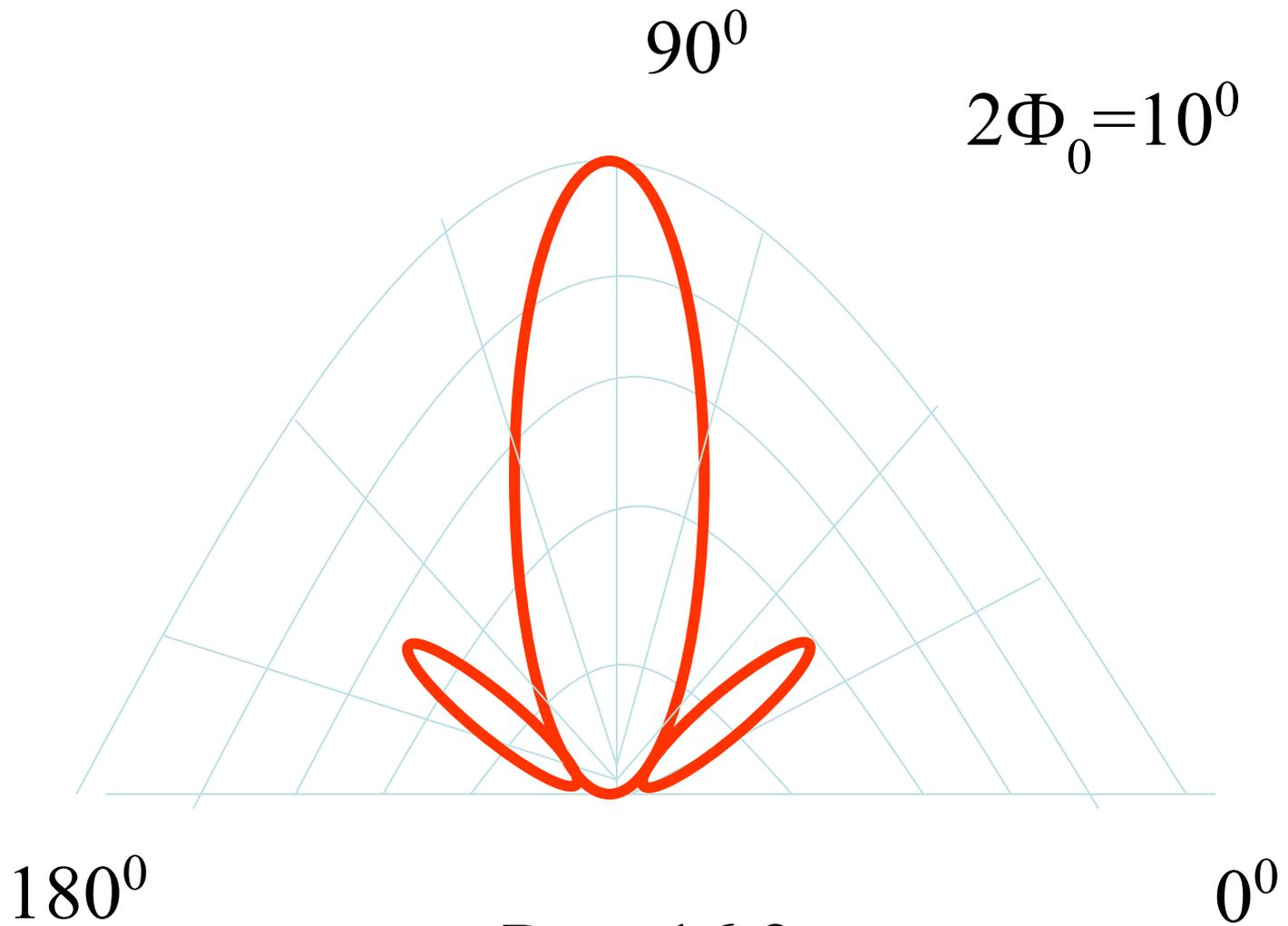


Рис. 16.2.



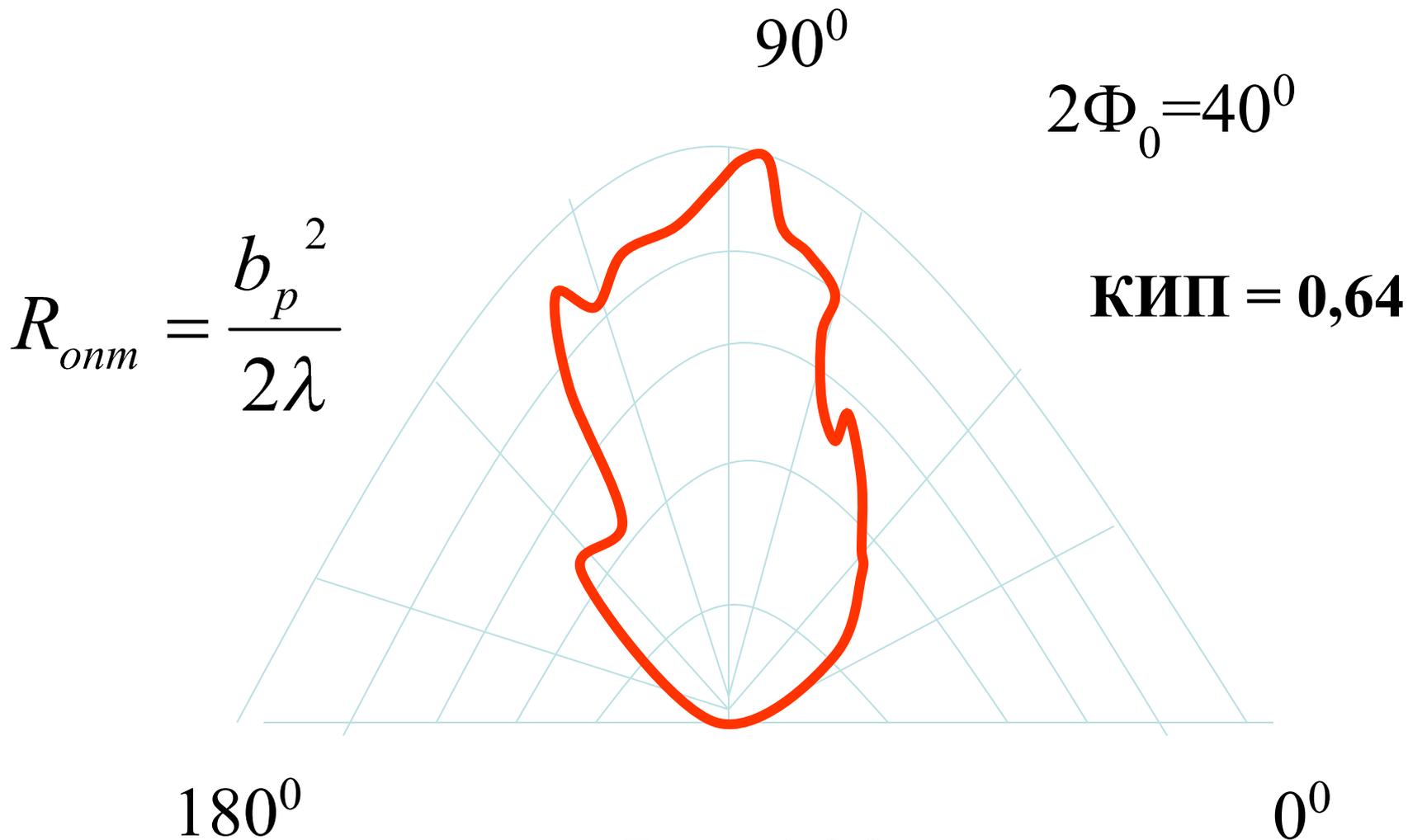


Рис. 16.3.



КНД

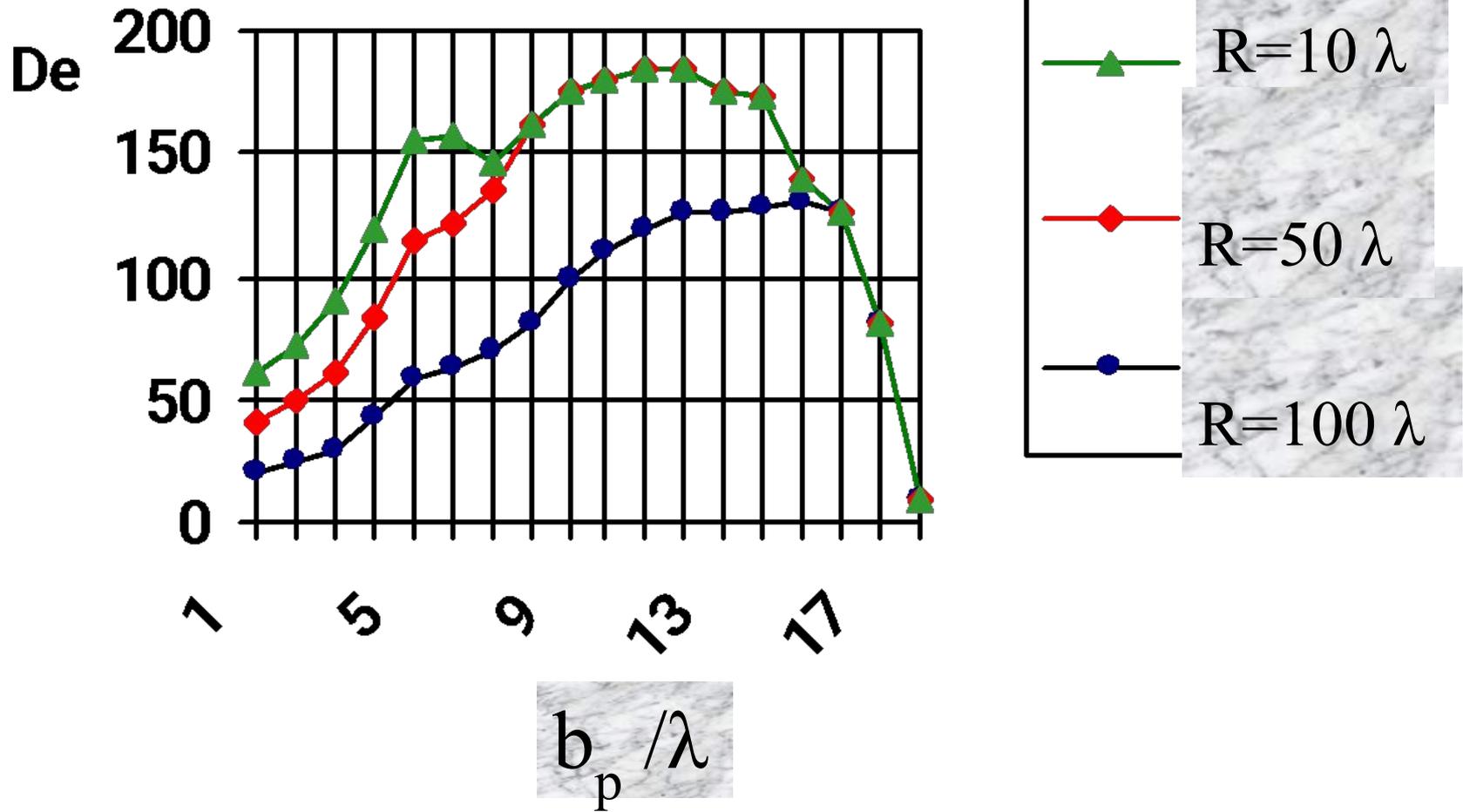


Рис. 16.4.



Для Е-плоскостного рупора

Ширина диаграммы направленности

$$2\Theta_{0,5} = 56^{\circ} \frac{\lambda_p}{b_p}$$

(16.3)



КНД для пирамидального рупора

$$D = \frac{\pi}{32} \left\{ D^H \frac{\lambda}{b_p} \right\} \left\{ D^E \frac{\lambda}{a_p} \right\}$$

(16.4)



$$D = 16 \frac{\sqrt{R^E R^H}}{\lambda} \quad (16.5)$$



Рупорная антенна с корректирующей линзой (для большей синфазности в раскрыве)

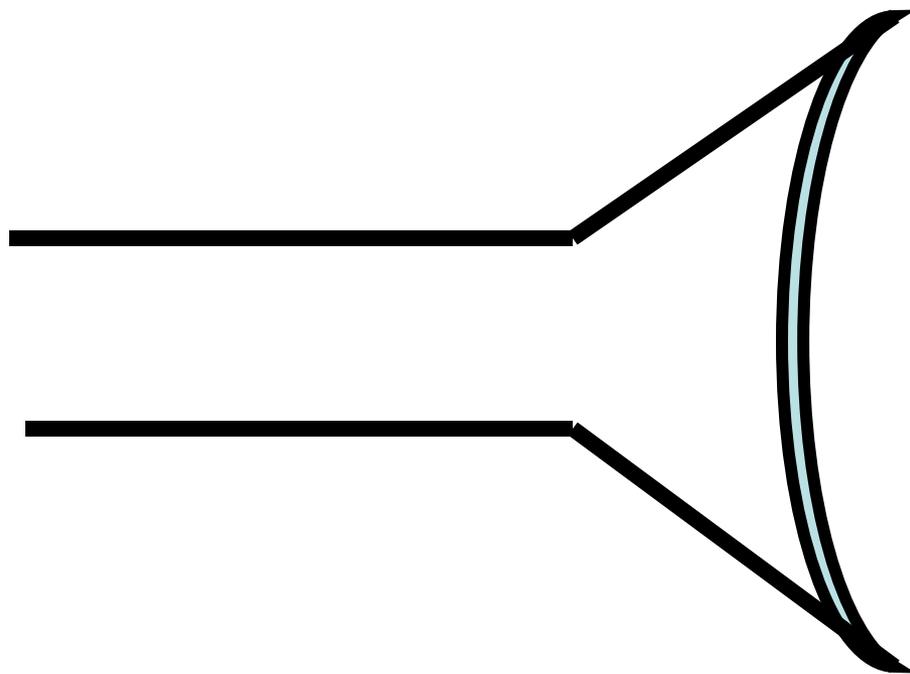
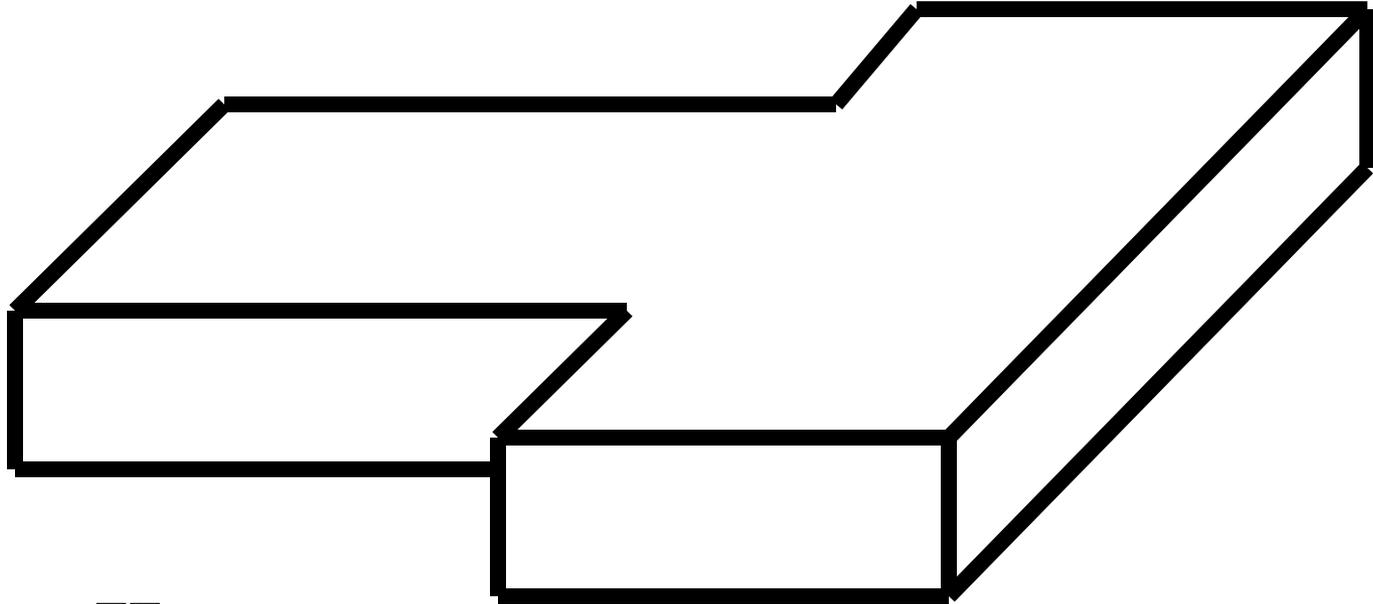


Рис. 16.5.



Коробчатый рупор



H₁₀, H₃₀

Рис. 16.6.



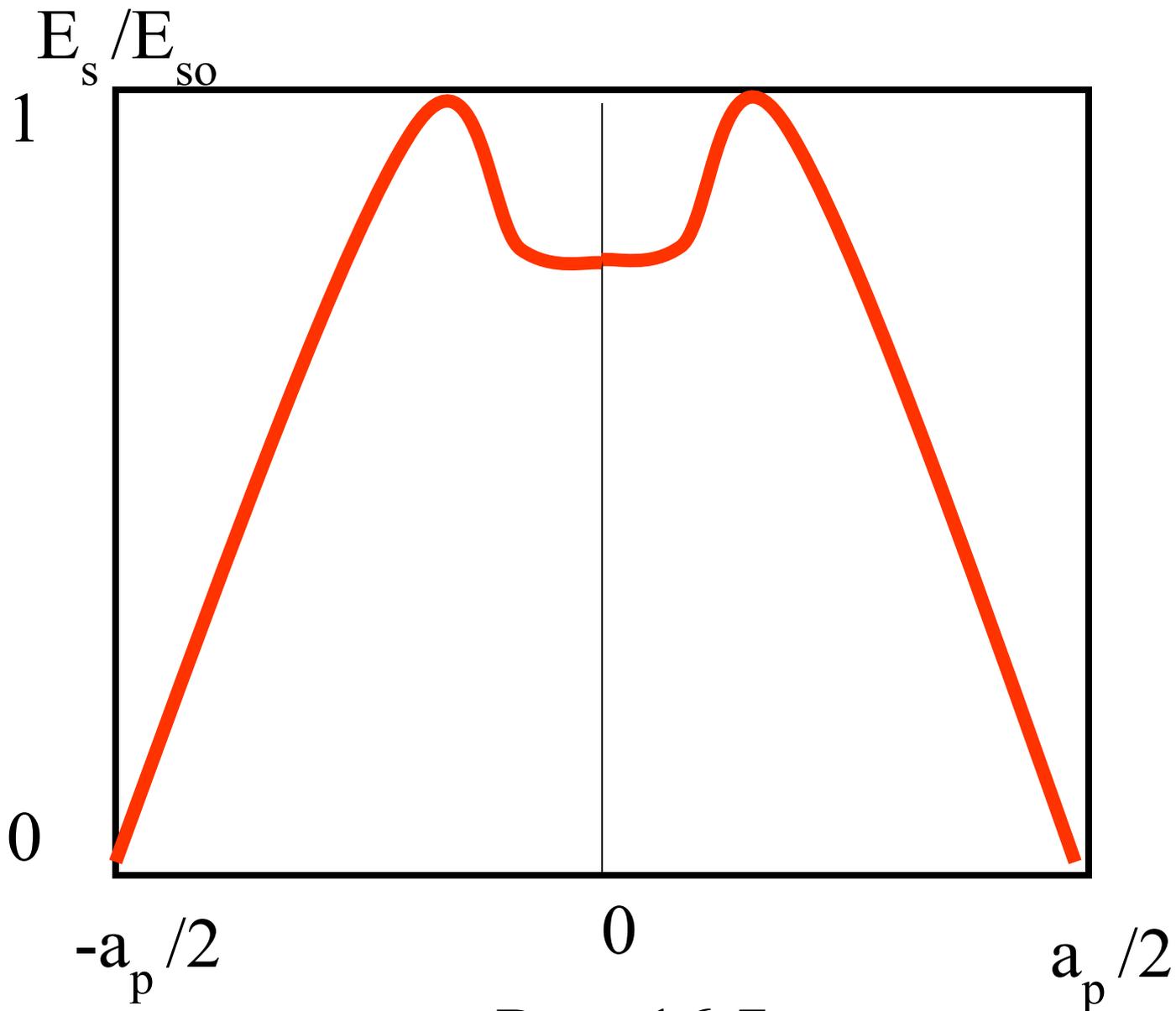


Рис. 16.7.



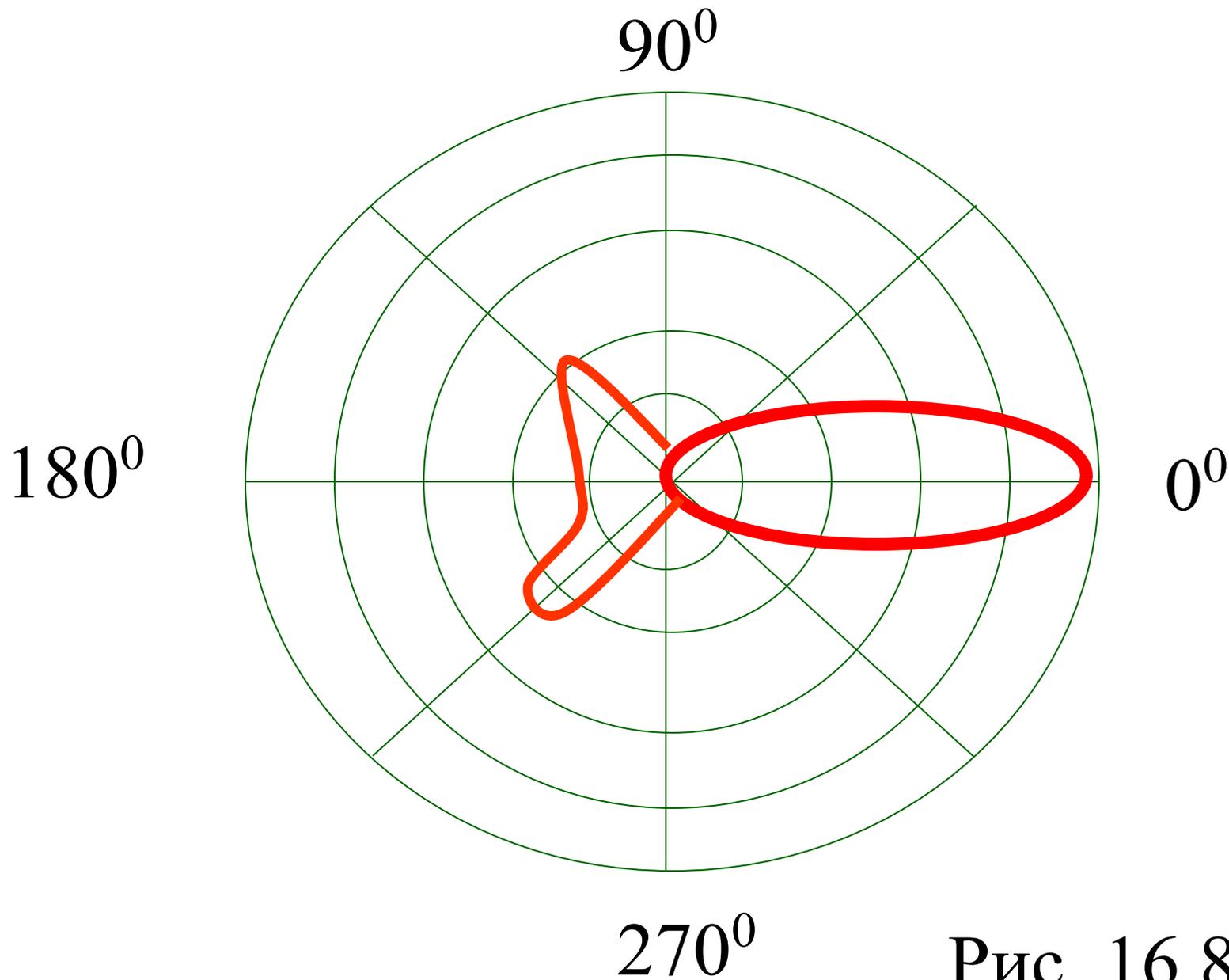


Рис. 16.8



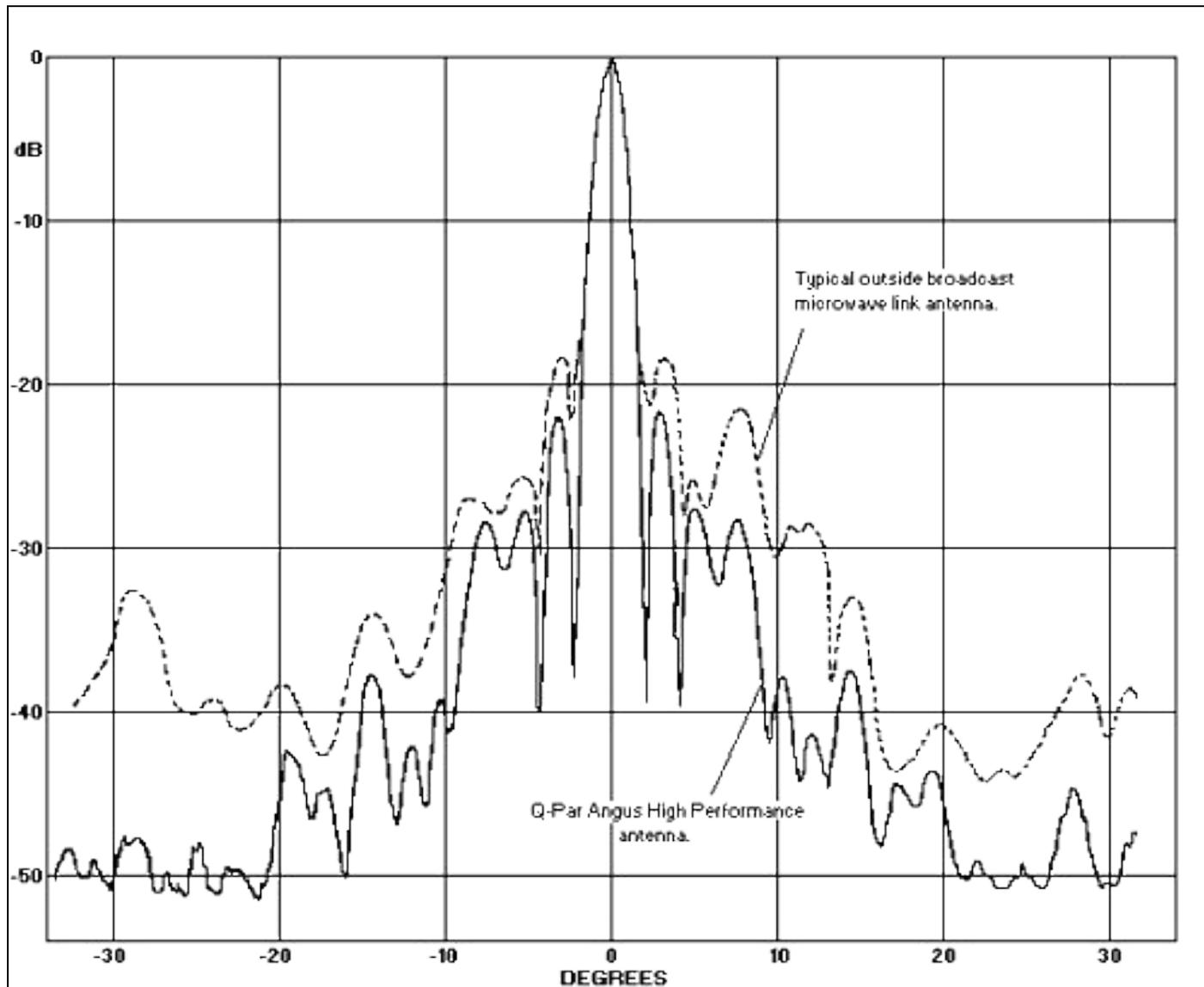


Рис. 16.9



16.2. Излучение открытого конца волновода

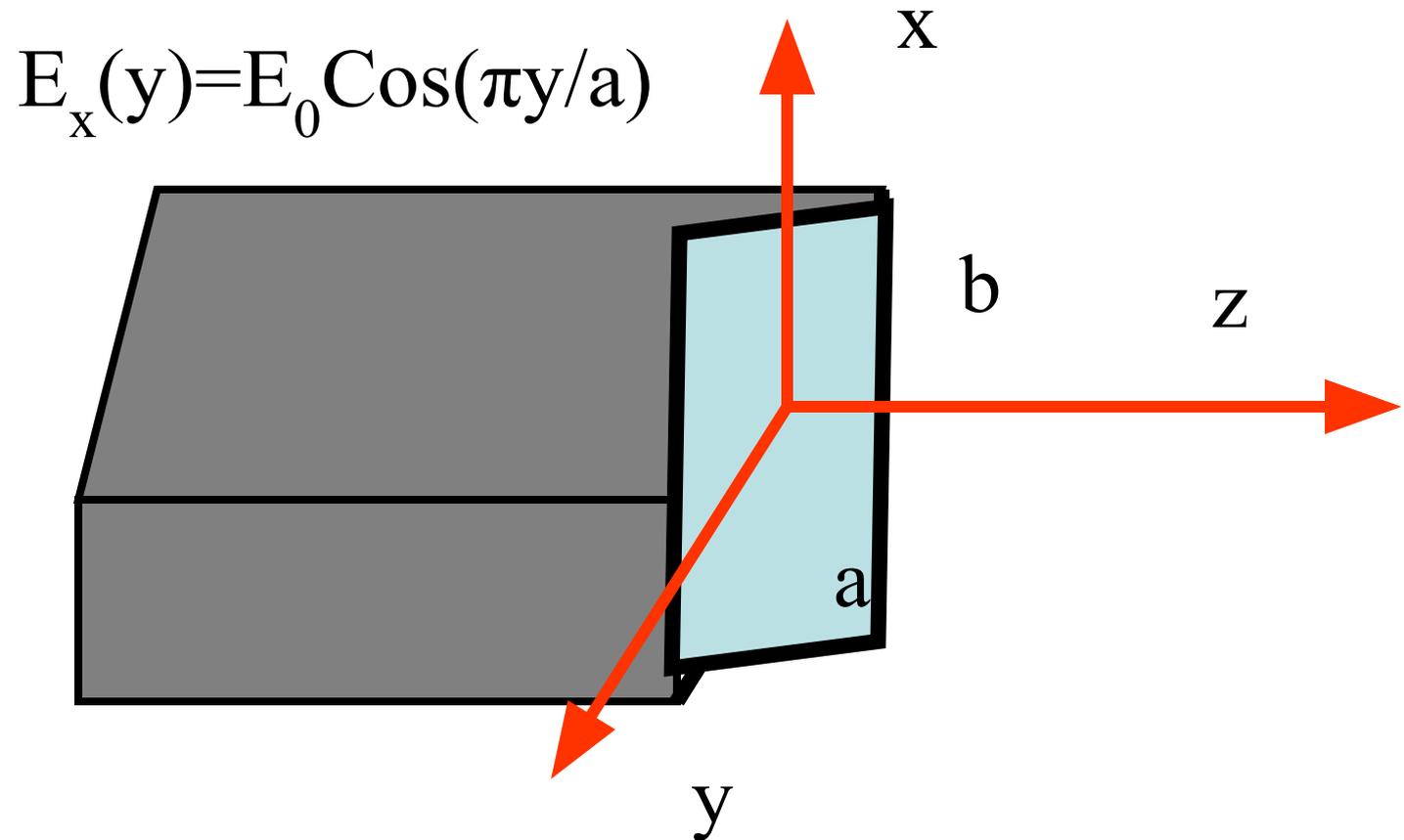


Рис.16.10.



$$F_{\Theta}^E(\Theta) = \frac{1 + \sqrt{1 - (\lambda/2a)^2} \cos \Theta}{1 + \sqrt{1 - (\lambda/2a)^2}}$$

$$\frac{\sin(0.5kb \sin \Theta)}{(0.5kb \sin \Theta)} * (16.6)$$



$$F_{\varphi}^H(\Theta) = \frac{0.25\pi^2 \left[\sqrt{1 - (\lambda/2a)^2} + \text{Cos}\Theta \right]^*}{\sqrt{1 - (\lambda/2a)^2} + 1} \frac{\text{Cos}(0.5ka\text{Sin}\Theta)}{\left(\frac{\pi}{2}\right)^2 - (0.5ka\text{Sin}\Theta)^2} \quad (16.7)$$



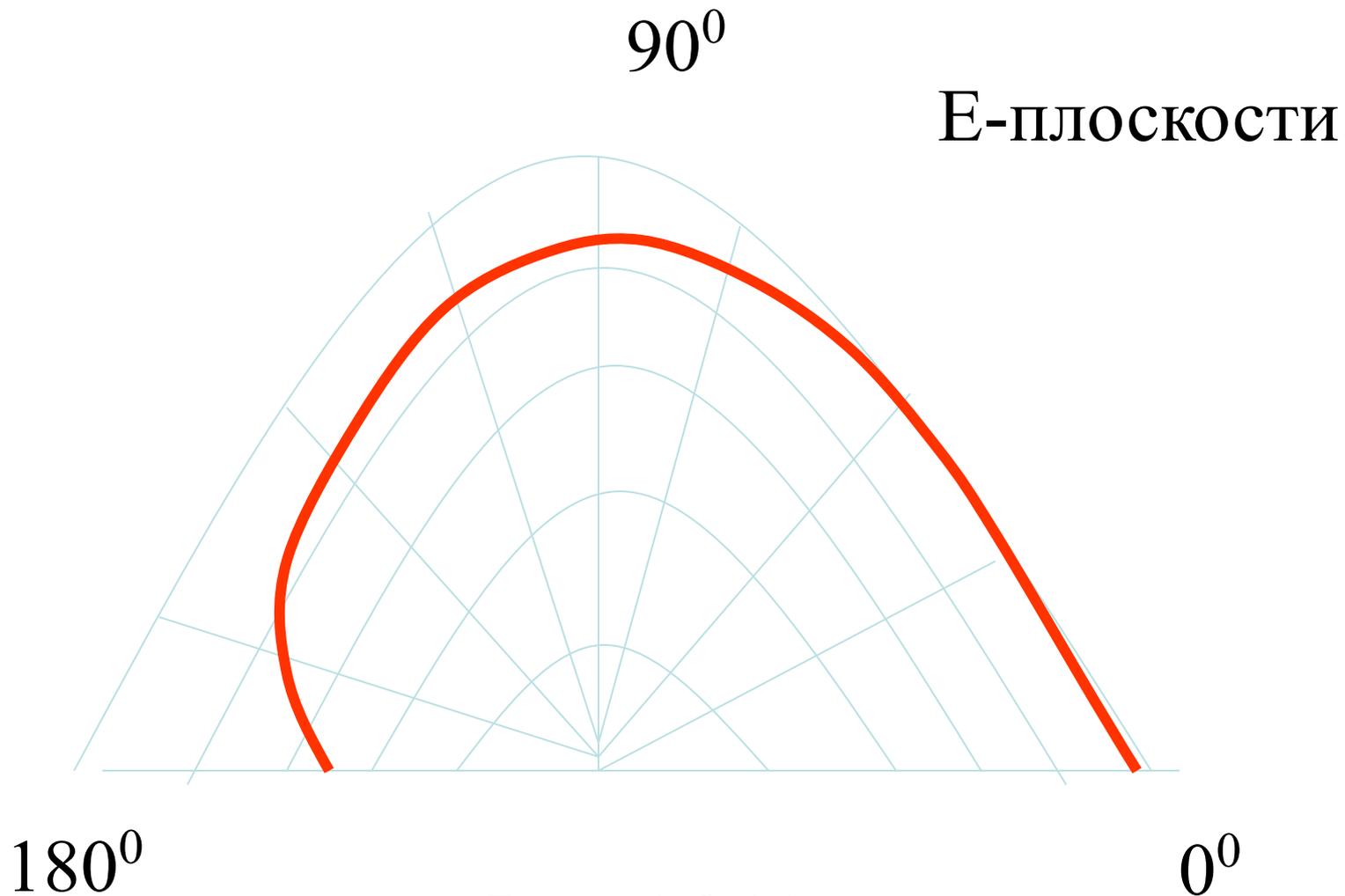


Рис. 16.11.



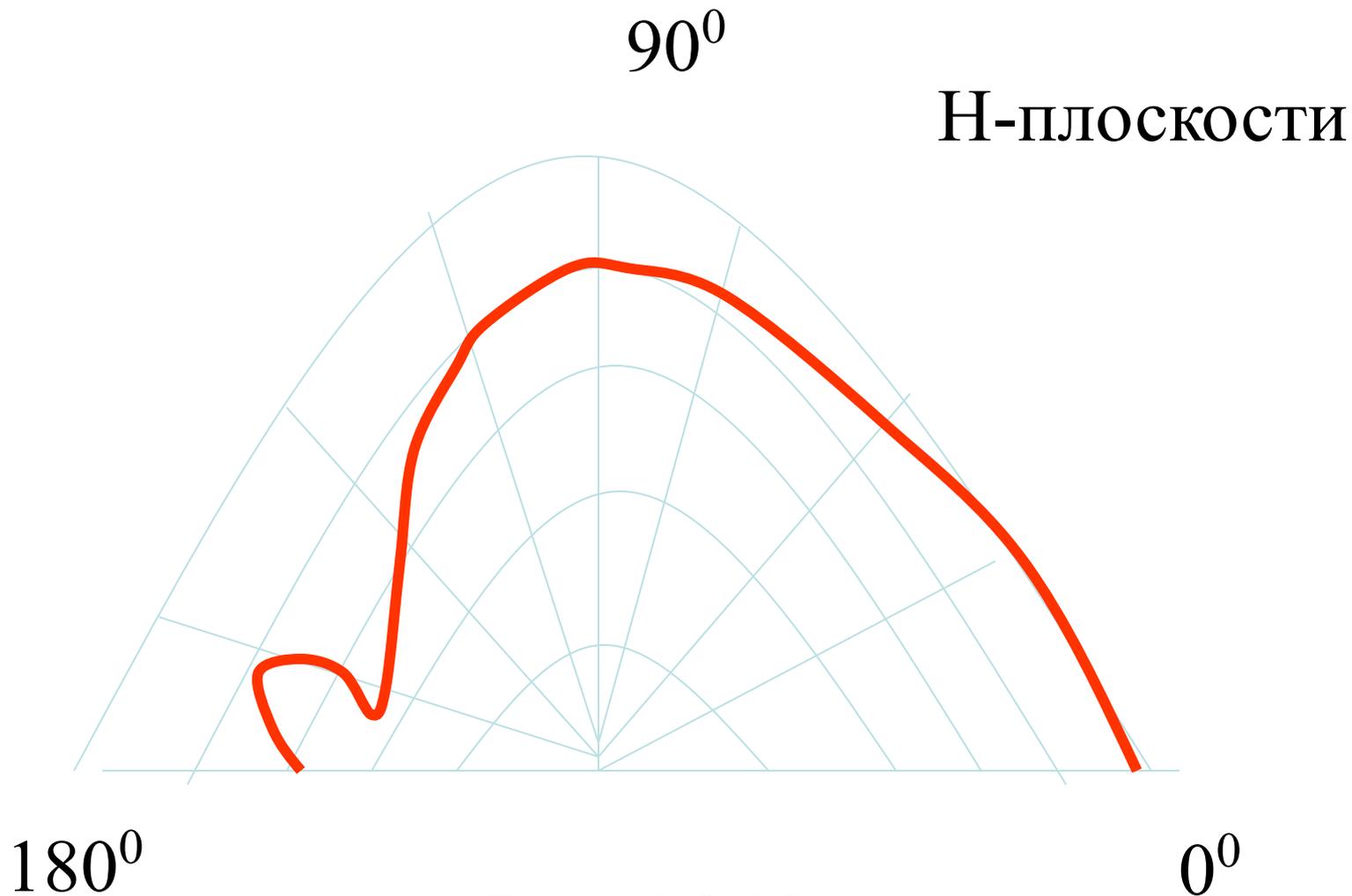


Рис. 16.12.





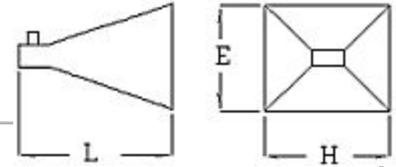
Рис. 16.13.





Рис. 16.14.





Standard Gain Horns - Dimensions in mm

Prices shown are for horns fitted with integral connectors

Part No.	WG	WR	F GHz	H	E	L	US \$
QSH6	6	650	1.1-1.7	880	620	1760	\$1960
QSH7	7	510	1.4-2.2	670	470	1340	\$1820
QSH8	8	430	1.7-2.6	575	410	1200	\$1386
QSH9A	9A	340	2.2-3.3	450	320	930	\$1190
QSH10	10	284	2.6-4.0	380	270	750	\$980
QSH11A	11A	229	3.3-4.9	300	215	615	\$882
QSH12	12	187	3.9-5.9	250	180	530	\$798
QSH14	14	137	5.8-8.2	175	125	390	\$588
QSH15	15	112	7.0-10.0	145	105	320	\$532
QSH16	16	90	8.2-12.4	120	85	265	\$490
QSH17	17	75	10.0-15.0	100	70	220	\$462
QSH18	18	62	12.4-18.0	80	60	175	\$448
QSH19	19	51	15.0-22.0	70	50	150	\$462
QSH20	20	42	18.0-26.5	55	40	130	\$476
QSH22	22	28	26.5-40.0	37	26	95	\$686



Линзовые антенны

Осесимметричные ЛА

Цилиндрические ЛА

Ускоряющие ЛА

Замедляющие ЛА

Рис. 16.12.



Замедляющие линзовые антенны

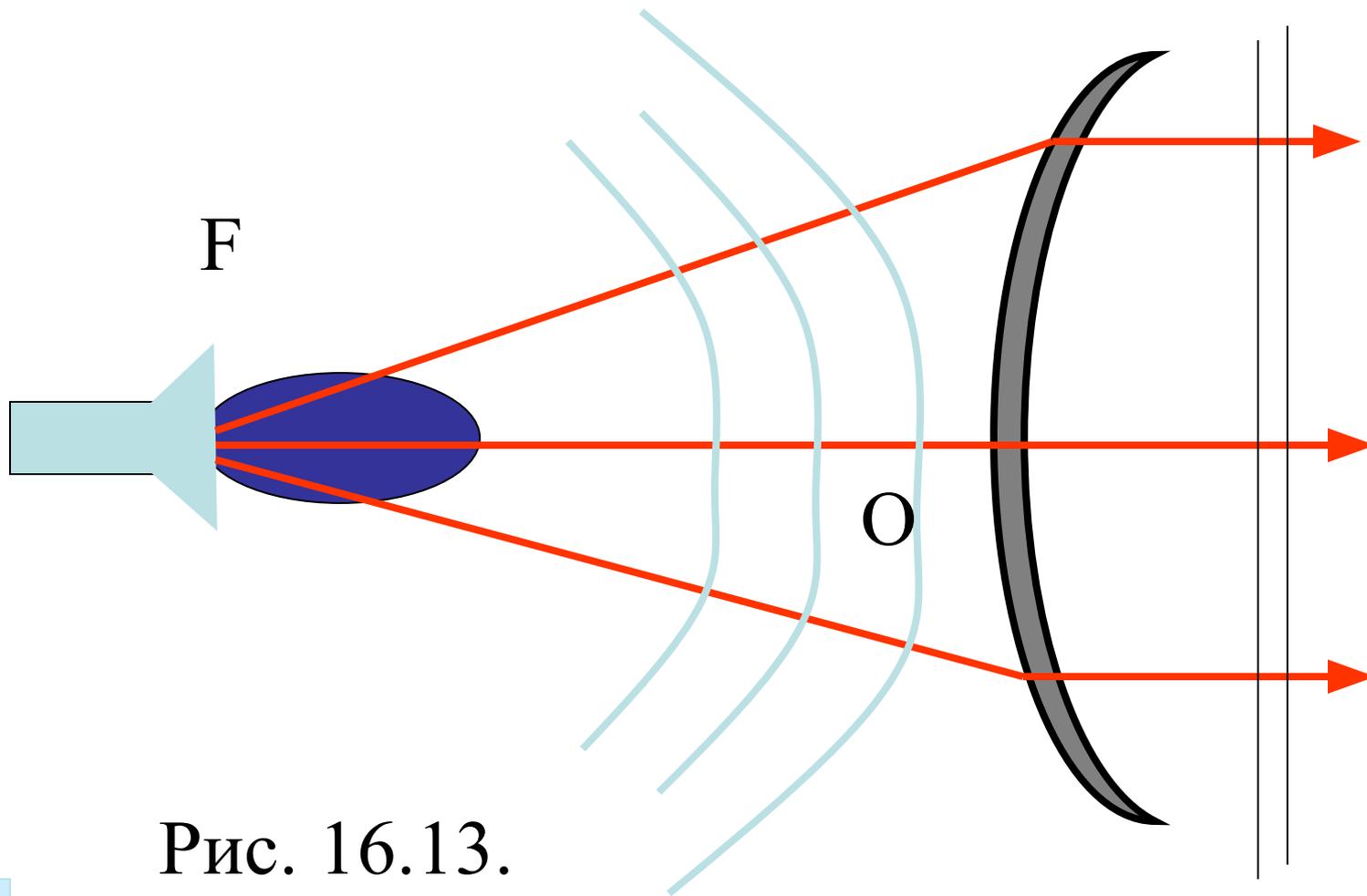


Рис. 16.13.



Ускоряющие линзовые антенны

$$\eta_{\text{пх}} = P_{\text{л}} / P_{\text{обл}}$$

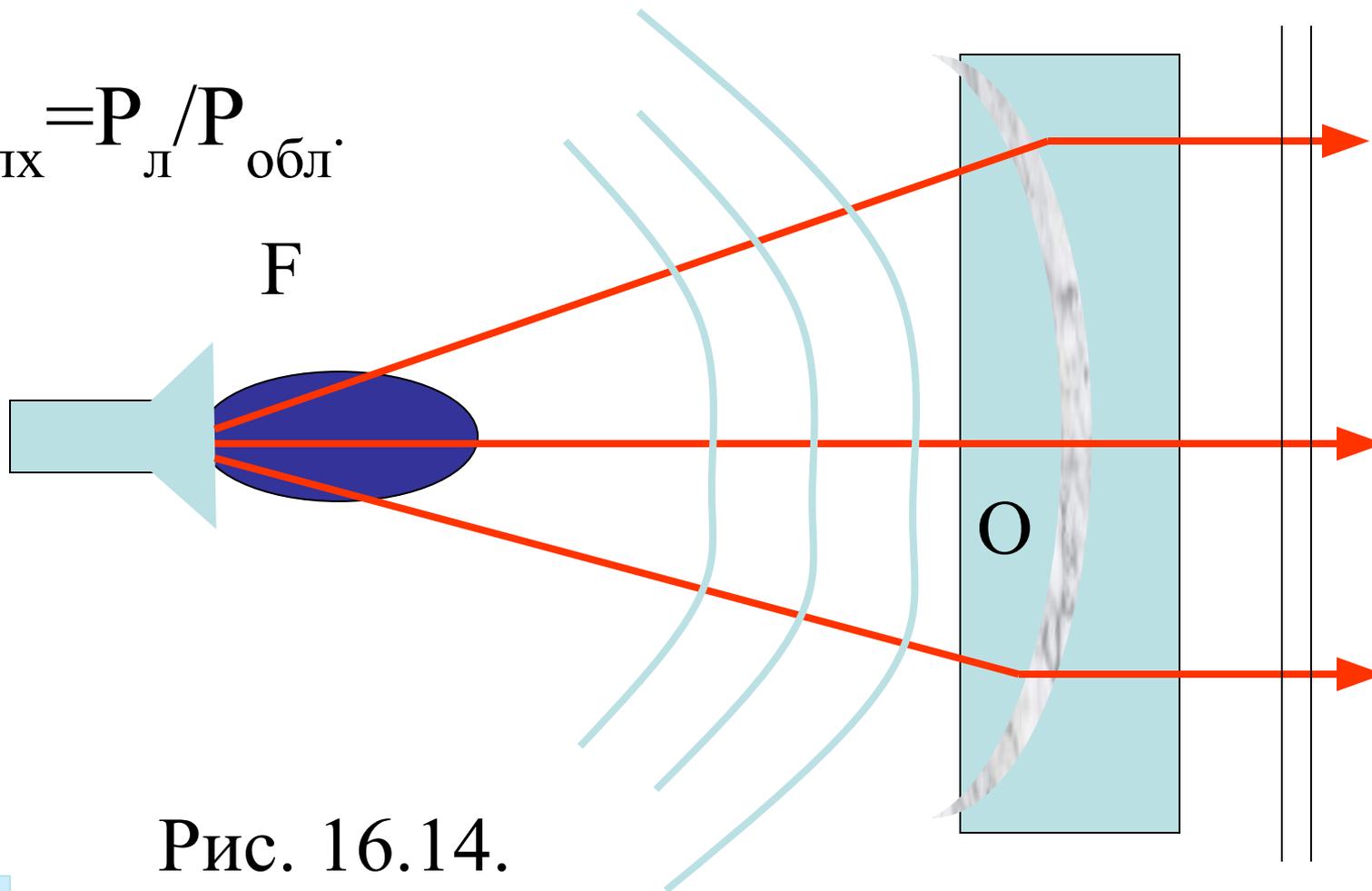


Рис. 16.14.



16.4. Уравнение профиля и толщины линзы

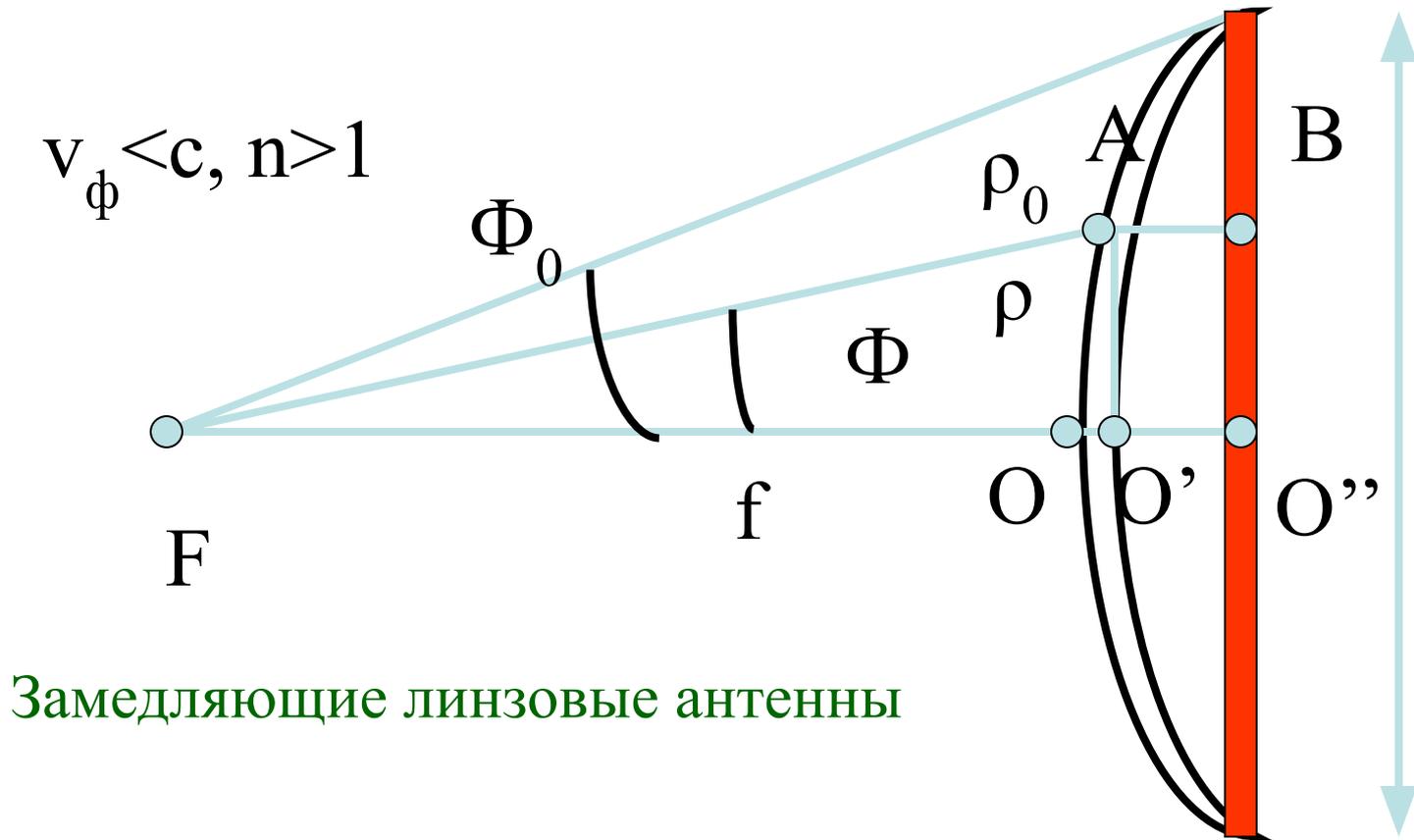


Рис. 16.15.



$$\rho = f + nOO' \quad (16.7)$$

$$OO' = FO' - f,$$

$$FO' = \rho \cos \varphi,$$

$$\rho = f(n-1) / (n \cos \Phi - 1),$$



Толщину линзы

$$OO'' = t = \rho_0 \cos \Phi_0 - f$$

$$\rho_0 = L \sin \Phi_0 / 2,$$

L - размер раскрыва линзы

$$t = \frac{L}{2(n-1)} \operatorname{tg} \left(\frac{\Phi_0}{2} \right) \quad (16.8)$$



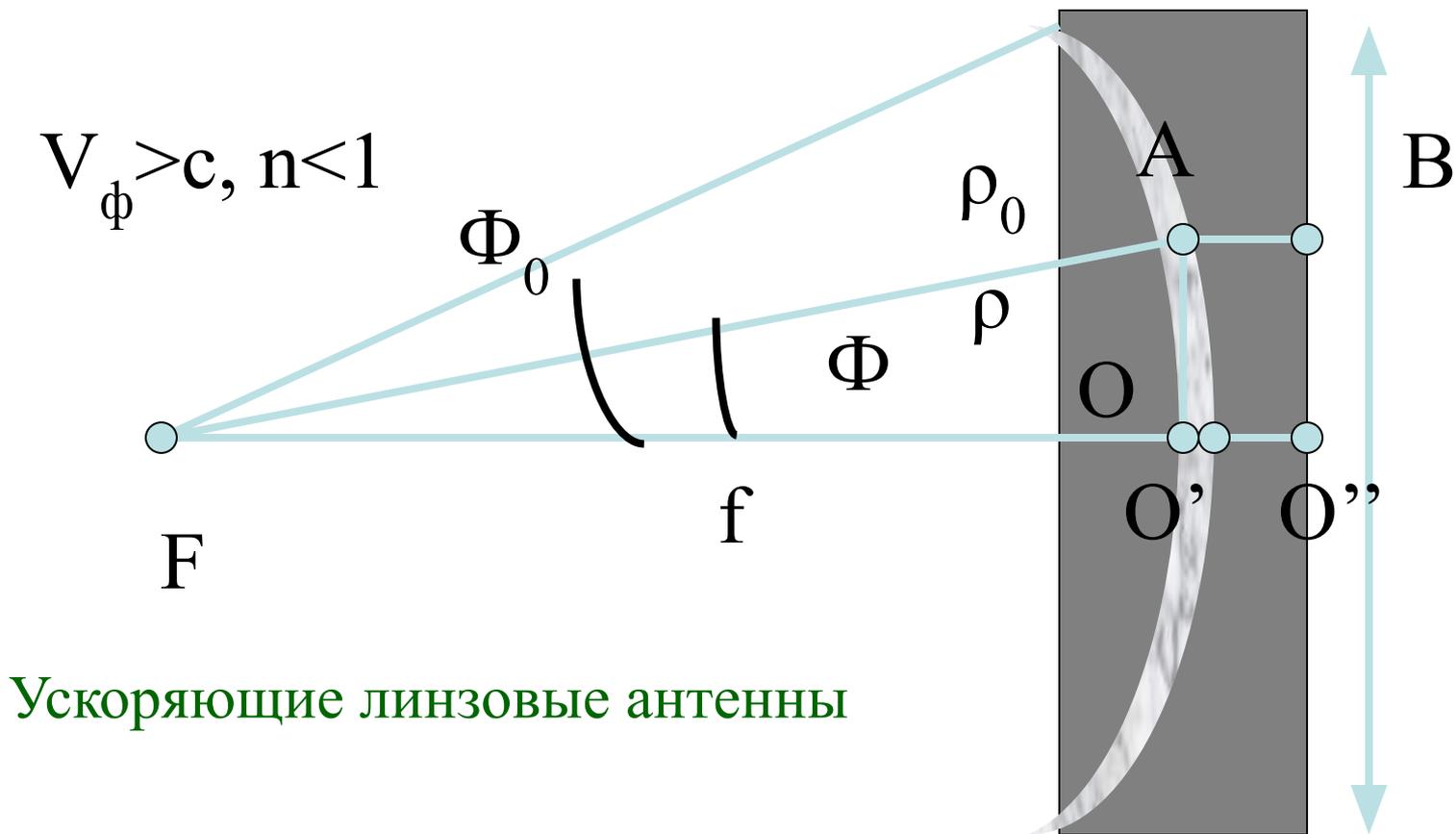


Рис. 16.16.



$$\rho = \frac{f(1-n)}{1-n\cos\Phi} \quad (16.9)$$

$$t^1 = \frac{L}{2(1-n)} \operatorname{tg}\left(\frac{\Phi_o}{2}\right) \quad (16.10)$$

$$t = t' + t''$$

