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Dik : $\alpha = 2$ $\quad \Delta = 0{,}001$
$a = 10\ \mu m$ $\quad \lambda = 1{,}3\ \mu m$
$n_1 = 1{,}48$

Dit : $n(r)$; $NA(r)$; V_c ; M ; λ_c

Jawab :

Asumsikan nilai $r \geq a$, maka :

* $n(r) = n_1\sqrt{1 - 2\Delta}$
$= 1{,}48\sqrt{1 - 2.0{,}001}$
$= 1{,}48\sqrt{0{,}998}$
$= 1{,}47851\ldots$

* $NA(r) = 0$ karena $r \geq a$

*
$$V_c = 2{,}405\sqrt{1 + \frac{2}{\alpha}}$$
$$V_c = 2{,}405\sqrt{1 + \frac{2}{2}}$$
$$V_c = 2{,}405\sqrt{2}$$
$$V_c = 3{,}401$$

*
$$M = \frac{\alpha}{\alpha + 2}\left(\frac{2\pi a n_1}{\lambda}\right)^2 \Delta$$
$$M = \frac{2}{2+2}\left(\frac{2\pi . 10 \times 10^{-6} . 1{,}48}{1{,}3 \times 10^{-6}}\right)^2 . 0{,}001$$
$$M = \frac{1}{2}(71{,}53)^2 . 0{,}001$$
$$M = 2{,}55\ \text{Mode}$$

* $\lambda_c = \frac{2\pi a n_1}{V_c}\sqrt{2\Delta}$
$\lambda_c = \frac{2\pi . 10 . 1{,}48}{3{,}401}\sqrt{2.0{,}001}$
$\lambda_c = 1{,}22\ \mu m$