

$$NA = \sin \alpha_0 = n_{\text{jedra}} \sin \alpha = 1,47 \cdot \sin 8^\circ = \underline{\underline{0,2046}}$$

Razmerje površin preseka jedra in obloge znaša:

$$\frac{A_j}{A_0} = \frac{d_j^2}{d_0^2 - d_j^2} = \frac{d_1^2}{(d_1 + 2h)^2} = \frac{d_1^2}{d_2^2 - 4d_1h - 4h^2}$$

$$4h^2 - 4d_1h + \frac{d_j^2}{d_0^2 - d_j^2} \cdot (d_2^2 - d_1^2) = 0$$

$$4h^2 - 60h + \frac{100}{15625 - 100} \cdot (625 - 225) = 0$$

$$4h^2 - 60h + 2,576 = 0$$

$$h = \frac{60 - \sqrt{3600 - 41,22}}{8} \text{ mm} = \underline{\underline{0,044 \text{ mm}}}$$

Dolžino dobljenega vlakna dobimo tako, da izenačimo jedra ali obloge.

$$V_0 = \frac{\pi}{4}(d_2^2 - d_1^2)l_c = \frac{\pi}{4}(d_0^2 - d_j^2)l_v$$

$$l_v = \frac{d_2^2 - d_1^2}{d_0^2 - d_j^2} \cdot l_c = \frac{625 - 225}{0,015625 - 0,0001} \cdot 1 \text{ m} = \underline{\underline{25765 \text{ m} = 25,8 \text{ km}}}$$

$$l = \frac{c}{2fn} = \frac{3 \cdot 10^8 \text{ m/s}}{2 \cdot 450 \text{ MHz} \cdot 1} = 0,333 \text{ m} = \underline{\underline{33,3 \text{ cm}}}$$

$$I = \frac{|Q_e|}{W_f} \eta P = \frac{|Q_e| \eta P}{hc} \cdot \lambda = \frac{1,6 \cdot 10^{-19} \text{ As} \cdot 0,75 \cdot 100 \cdot 10^{-9} \cdot 0,78 \cdot 10^{-6} \text{ m}}{6,624 \cdot 10^{-34} \text{ W s}^2 \cdot 3 \cdot 10^8 \text{ m/s}} = 4,71 \cdot 10^{-8} \text{ A} = \underline{\underline{47,1 \text{ nA}}}$$

$$\Delta t = (D_1 l_1 + D_2 l_2 + D_3 l_3) \Delta \lambda$$

$$\Delta t = \left(+17 \frac{\text{ps}}{\text{nm} \cdot \text{km}} \cdot 20 \text{ km} - 5 \frac{\text{ps}}{\text{nm} \cdot \text{km}} \cdot 40 \text{ km} + 5 \frac{\text{ps}}{\text{nm} \cdot \text{km}} \cdot 10 \text{ km} \right) \cdot 1 \text{ nm} = \underline{\underline{190 \text{ ps}}}$$

$$C = \frac{1}{3\Delta t} = \underline{\underline{1,75 \text{ Gbit/s}}}$$