THIN LAYERS ON THE L A S E R' S SOURCES FROM Y A G-CRISTAL AND SILICATE GLASS DOPING WITH Nd^{3+}

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It is done an analyisis of programme's problems thin-layers on the LASER'S sources and it's given some of tehnological parameter's which termquality of the layer's for hard-body LASER'S sources.It's given a process of the calculation two-fold antireflection layer on the low-index base(LASER'S glass) and high index base(YAG-cristal).

It's done an analyisis of choice the material and number of the under-layer's at realization LASER'S mirrors for simetrical resonator.It's appeared on some problems which are announced at realization strong multiplelayer's structures on LASER'S radiate.

Calculation antireflex layers

Studying the layer is performed by recurrent formules of Vlasov for three limited surfaces.The condition for minimum reflectio is given by the expression(1.1)

$$R_{min}=\left(\frac{r_1-r_{24}}{1-r_1 r_{24}}\right)^2 \qquad (1.1)$$

where r_{24} is the cofficient of the reflection under layer ZrO_2 on base Zero of the reflection is getting when $r_1=r_2$, then the values of phases Δ_1 and Δ_2 are given by the expressions(1.2) and(1.3).

$$\cos\Delta_2 = \frac{r_2^2 + r_3^2 - (1 + r_2^2 r_3^2)}{2 r_2 r_3 (1 - r_1^2)} \qquad (1.2.)$$

$$\mathrm{tg}\,\Delta_1 = \frac{r_3(1 - r_2^2)\sin\Delta_2}{r_3(1 + r_2^2)\cos\Delta_2 - r_2(1 + r_3^2)} \qquad (1.3.)$$

The expression 1.3. is complicated in general case, because some of facts are reduced considering known sign of cofficient of reflections r_2 and r_3 for case which is considered. The values of phases are determinated with optical thickness and wave band with expression 1.4.

$$i = \frac{4\pi}{\lambda_0} n_i d_i \qquad (1.4.)$$

where $\lambda_0 = 1,06\,\mu$ and n_i, d_i are refractive index and geometrical thickness under layer's. Profiting the value of refractive index 1,5085(midlle value)YAG, ZrO_2 and SiO_2 from tables we find cofficient of reflections from limited surfaces n_1/n_2:n_2/n_3 and n_3/n_4,(r_1;r_2 and r_3)by Frenel's common expression for cofficient amplitude of reflection on limited surface two different optical's dimains.

$$r_i = \frac{n_i - n_{i+1}}{n_1 + n_{i+1}} \qquad (1.5.)$$

The process of computing is the next:first we compute the cofficient of reflection by(1.5.)then phase Δ_1 and Δ_2 at the base(1.2.) and(1.3.) and finally geometrical thickness at the base(1.4.).