$$\sin^4 I + 2\sin^2 I(k_0^2 - n_0^2) + (k_0^2 + n_0^2)^2 = \sin^4 I tg^4 I \quad . \quad . \quad (27)$$

With metals $n_0^2 + k_0^2$ is comparatively large compared to the two first terms of the first member of (27). By approximation we get therefore:

$$\sin^2 I \, tg^2 I = k_0^2 + n_0^2,$$

from which follows with the same degree of approximation $\sin^2 I = 1 - \frac{1}{k_0^2 + n_0^2}$.

Introducing this in (27), we get:

$$\sin I tg I = \sqrt{k_0^2 + n_0^2} \left\{ 1 + \frac{1}{4} \frac{2(k_0^2 - n_0^2) - 1}{(n_0^2 + k_0^2)^2} \right\} \quad . \quad . \quad . \quad (28)$$

In the following way we get an approximate value for H. From (23) and (24) follows:

$$n_I^2 - k_I^2 = n_0^2 - k_0^2 = \sin^2 I + \sin^2 I \, tg^2 I \cos 4H,$$

so

$$\cos 4H = \frac{n_0^2 - k_0^2 - \sin^2 I}{\sin^2 I \, tg I}$$

From this follows, as $tg^2 2H = \frac{1 - \cos 4H}{1 + \cos 4H}$, after substitution of the approximate value

$$\sin^2 I tg^2 I = (n_0^2 + k_0^2) \left\{ 1 + \sin^2 I \frac{k_0^2 - n_0^2}{k_0^2 + n_0^2} \right\}$$

which follows from (27),

$$tg\, 2H = \frac{k_0}{n_0} \left\{ 1 + \sin^2 I \frac{1}{n_0^2 + k_0^2} \right\}. \quad . \quad . \quad . \quad . \quad (29)$$ [1]

11. Finally it may be observed that the relations hold for any value of k. The reflection on perfectly transparent bodies is therefore a limiting case for the metallic reflection. [2]

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[1] Corresponding approximate formulae were given by DRUDE in WINKELMANN, Physik II. 1, p. 823, 824.

[2] Cf. VOIGT, Wied. Ann., **24**, 146, 147, 1885.

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