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The computer model of the laser fire detector which principle of operation is based on an analysis of the intensity fluctuations of the laser beam is developed. Dependences of the informative parameter of the detector on the location and intensity of the ignition source are investigated. The laboratory experiments that confirm the value obtained by the computer model are made.

Key words: *laser fire detector, computer model, tetrahedral retroreflector, turbulence.*

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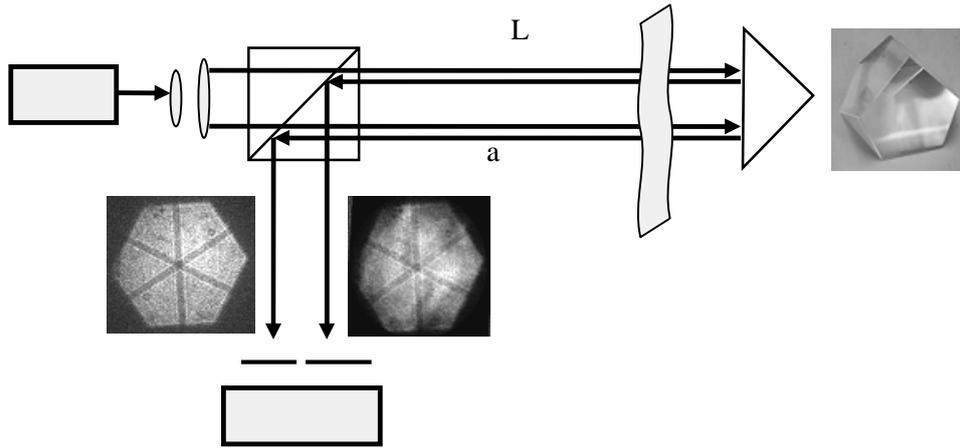
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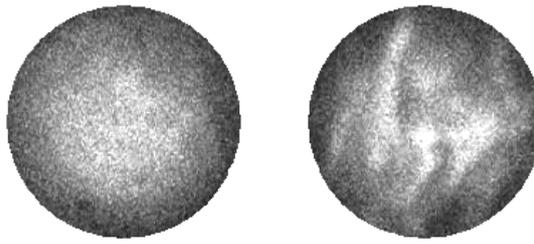
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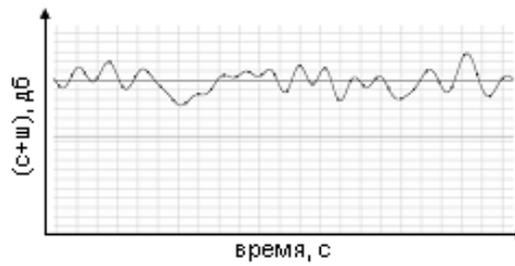
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$$\ln I/I_0 = 1 - \Phi(\ln(1+a)/\sigma) + \Phi(\ln(1-a)/\sigma), \quad \sigma^2 - [1]$$

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$$\Phi(x, y) = \frac{k}{2\pi i} \frac{e^{ikl}}{l} \int_{S'} \Psi(x', y') \exp\left\{\frac{ik[(x-x')^2 + (y-y')^2]}{2l}\right\} dx' dy',$$

$$\Psi(x', y') = \Phi(x, y) - \dots, \quad l - \dots$$

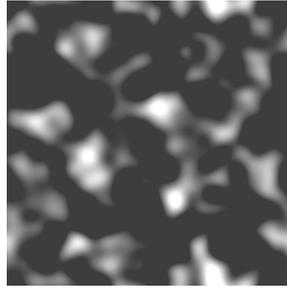
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$$S_x(w) = 0.033 C_n^2 (w^2 + w_0^2)^{-11/6} \exp(-w^2/w_m^2), \quad C_n^2 - \dots$$

$$, \quad w_0 = 2\pi/L_0, \quad w_m = 5.92/l_0 \quad (L_0 \quad l_0 - \dots)$$

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$$(C_n^2, L_0, l_0)$$

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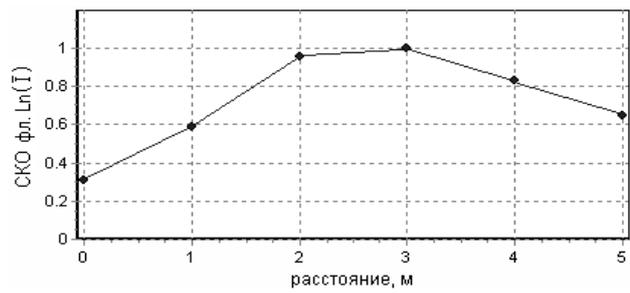
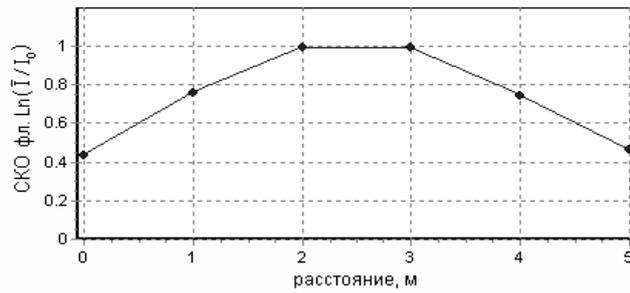
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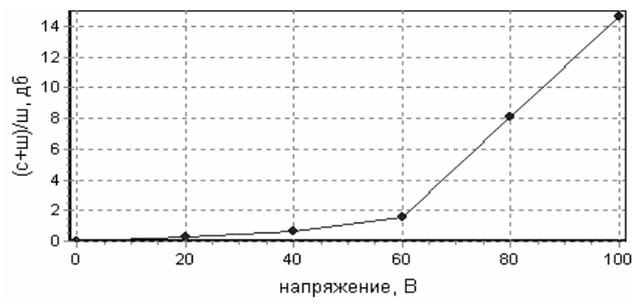
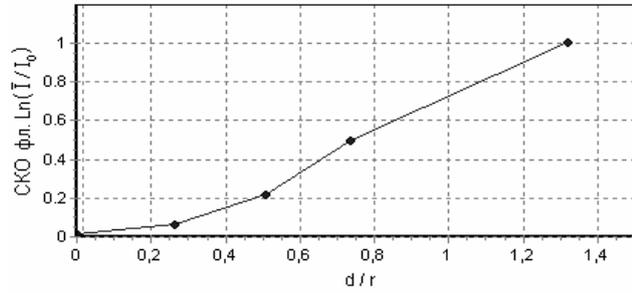
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