gadolinium near the Curie point the coefficient R_i is almost half as large as the coefficient R_I, and for the invar alloy R_i is three times the value of R_I.

It is interesting to note that, according to the data of Babushkina [7], the paramagnetic constant R_p of gadolinium, measured at temperatures greatly exceeding the Curie point, is numerically close to the values of R_i obtained by us by measuring the Hall effect in gadolinium at temperatures below the Curie point. It follows therefore that the change of the Hall emf in the paramagnetic and in the para-process regions can be described by the same constant $R_p \simeq R_i$, which does not depend on the temperature, and consequently does not depend on the over-all magnetic resistance ρ_m.

This fact is essentially new and calls for a special theoretical examination of the nature of the anomalous Hall field in the region of the para-process.

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SINGLE-FREQUENCY RUBY LASER WITH ACTIVE Q-SWITCH

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It was shown in [1] that if radiation from another laser is introduced into the resonator of a ruby laser at the instant of Q-switching, then the laser emission spectrum coincides fully with the spectrum of the introduced radiation. Further experiments were performed by us using a single-frequency master generator (henceforth - first generator) operating in the free-running regime (Fig. 1). The mode selector for the first generator was made up of four TF-5 glass prisms with a total dispersion 15 ang. sec/cm^{-1} at $\lambda = 6943$ Å, and a diaphragm D_1 of 1.2 mm diameter. A single-frequency generation regime of the first laser was ensured at 5% excess above threshold.

The electronic circuitry switching the Q of the second laser was triggered by one of the spikes of the first laser. The time delay of the electronic circuitry did not exceed 0.5 μsec, thus ensuring rigid synchronization of the Q-switching time of the second laser
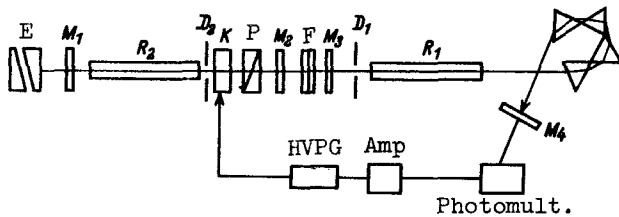
Fig. 1. Diagram of experimental setup: $M_1, M_2,$ M_3, M_4 - mirrors with reflection coefficients 40, 96, 97, and 98%; R_1, R_2 - ruby crystals 120 mm long and 12 mm in diameter; D_1, D_2 - diaphragms 1.2 mm in diameter; K - Pockels cell; P - polarizer; F - set of neutral light filters; E - Fabry-Perot etalon; Amp - amplifier; HVPG - high-voltage pulse generator.
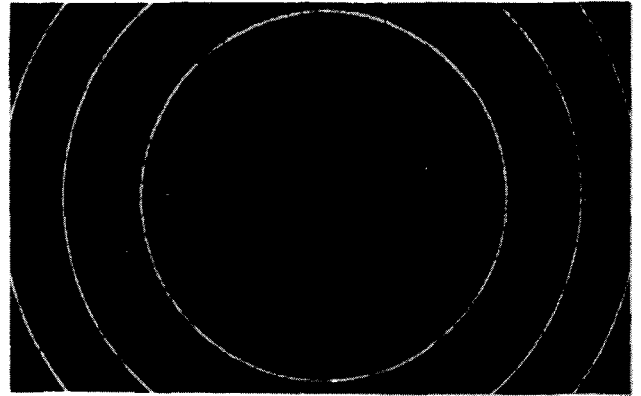

Fig. 2. Spectrogram of emission of the second generator.

with the instant of entrance of the radiation of the chosen spike into its cavity. The second laser generated in this case a powerful (10^8 W/cm^2) single-frequency pulse. Figure 2 shows the spectrogram of the emission of the second generator, obtained with the aid of a Fabry-Perot etalon 3 cm thick. The measure line width of the radiation did not exceed 0.005 cm^{-1}, this being equal to the resolution limit of the employed interferometer. The distance between the longitudinal modes of the two cavities was 0.008 cm^{-1}. Notice should be taken of the good frequency stability of the radiation. Out of 50 flashes, the greatest deviation from the average value of the generation frequency did not exceed 0.025 cm^{-1}. Such a stability is ensured by the features of the chosen method for selecting the modes of the first laser and the low pump level of the ruby R_1. The width of the directivity pattern of the emission of the second laser without an external signal was 1.5 x 10^{-3} rad. When the external signal was applied, it equaled approximately the width of the directivity pattern of the introduced radiation and amounted to 2 x 10^{-4} rad, which is close to the diffraction limit. The intensity of the introduced radiation was approximately 10^{-2} W. To use the entire cross section of the ruby R_2 (without the diaphragm D_2 in the resonator), it is necessary to broaden the beam of the introduced radiation to the diameter of the ruby R_2.

Preliminary estimates indicate the possibility of obtaining powerful generation with adjustable radiation frequency in a range of several angstroms, and also of obtaining powerful generation on the R_2 ruby line. To this end it is necessary to tune the radiation frequency of the master generator by means of known methods (see, e.g., [2,3]).

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