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A possibility to control the polarization of high-energy photons by means of a laser beam

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Abstract: The elastic light-light scattering below the threshold of the e^+e^- pair production leads to a variation in polarization of hard γ -quanta traversing without loss a region where the laser light is focused. This effect can be used to control the γ -quantum polarization. Equations are obtained which determine the variation of Stokes parameters of γ -quanta in this case, and their solutions are given. It is pointed out that this effect can be observed in the experiment E-144 at SLAC. It should be taken into account and, perhaps, it can be used in experiments at future $\gamma\gamma$ colliders.

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