

Rare processes in photon-photon collisions using beams of the Compton source project of the National Center for Physics and Mathematics

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The research investigates rare processes in photon-photon collisions (light-by-light scattering and the production of hypothetical scalar and pseudoscalar (ALP) particles) using photon beams of the future project of the NCPHM Compton source, based on the inverse Compton effect: the photon beam generated by the Compton source collides with a photon beam from a laser.

- A previously unknown formula for the cross section of photon-photon scattering in the $\omega^* \ll m_e$ approximation in an arbitrary reference frame, the angular distribution, and the number of events (the yield of gamma quanta) in the process of light-by-light scattering using photon beams of the future NCPHM Compton source project have been obtained;
- Constraints on the parameter region (mass and coupling constant) for which the production cross section of scalar and pseudoscalar (ALP) particles dominates over the light-by-light scattering cross-section have been obtained.

Author: ANDREEVA, Anna (Lomonosov Moscow State University Branch in Sarov)

Co-author: BOOS, Eduard (SINP MSU)

Presenter: ANDREEVA, Anna (Lomonosov Moscow State University Branch in Sarov)

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