Photon splitting in a strongly magnetized plasma

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The process of photon splitting is investigated in the presence of a strongly magnetized electron-positron plasma. We calculate the amplitude of the process at finite electron chemical potential and temperature. The partial amplitudes and polarization selection rules in a neutral electron-positron plasma are obtained. It is found that the new splitting channels forbidden in magnetized vacuum become allowed. The probabilities of the photon splitting are calculated with account for photon dispersion and wave function renormalization in a strongly magnetized plasma. We show that, although the photon splitting is suppressed at high temperatures, there is space of parameters where photon splitting dominates over pure magnetic field result in the low temperature limit. Possible astrophysical applications of the process under consideration are discussed.