TWO-PARTICLE PHOTODISINTEGRATION
OF ^{4}He: ^{4}He(γ,d)d, ^{4}He(γ,p)T, ^{4}He$(\gamma,\mathrm{n})^3$He

O.E. Koshchii[1], P.E. Kuznietsov[2]

[1]V.N. Karazin Kharkiv National University
(4, Svobody Sq., Kharkiv 61077, Ukraine;
e-mail: alex.koshchii@gmail.com),
[2]Institute of Electrophysics and Radiation Technologies,
Nat. Acad. of Sci. of Ukraine
(28, Chernyshevsky Str., Kharkiv 61002, Ukraine;
e-mail: kuznietsov@ukr.net)

S u m m a r y

Using a covariant diagram technique and the concept of a nucleus as an elementary particle, we calculated the differential cross-sections for two-particle photodisintegration reactions of ^{4}He. The only functional parameter is the vertex structure function, which describes the "collapse" of ^{4}He nucleus and the nucleon remnants. The interaction of a real photon is determined by the value of particles charge, since the electromagnetic (EM) form factors are calculated at the photon point. The inseparability property of the electric charge from the particle mass allowed us to match the energy-momentum and charge conservation laws in the interaction. Therefore, the requirement of gauge symmetry is immediately satisfied. The covariant amplitude of the process equals to the sum of pole diagrams and the regular part, which is added to fulfil the EM current conservation requirement.