

Contribution of 20.58 MeV gamma-line in $E > 20$ MeV solar flare gamma emission, and He-3 concentration in the deep layers of the solar atmosphere

B. M. Kuzhevskij and E. V. Troitskaia

D.V. Skobel'syn Institute of Nuclear Physics, Moscow State University, 119899 Moscow, Vorobjevy Gory

Abstract. We analyse using Monte-Carlo modelling 20.58 MeV gamma-line fluxes arising from solar flare neutron radiative captures by He-3 nuclei in the solar atmosphere. The dependencies of fluxes on initial solar flare neutron energy spectra and He-3 content in photospheric and subphotospheric layers are studied. The cross sections of this reaction are very small, but some astrophysical ideas lead to the known supposition about high He-3 content in the deep layers. It can lead to measurable 20.58 MeV gamma-ray fluxes in future experiments. In principle it is possible to separate this

gamma-emission from pi-zero-meson decay wide gamma-continuum. Indeed, 20.58 MeV gamma-emission must be delayed because of the largest efficiency at thermal neutrons, when pi-zero-meson gamma-emission is "instantaneous". If the separation of the two types of gamma-emission will be possible in the future experiments, then some conclusions about He-3 content in the deep layers may be done.

Correspondence to: E. V. Troitskai
(troit@srdlan.npi.msu.su)