

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

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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.

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