

# Coherent influence of RF field on the gamma-optical properties of a medium upon crossing-anticrossing of nuclear levels

Lyubimov V., Popov E., Samartsev V., Kutsenko S., Polyakov N.  
*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

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## Abstract

A new approach to the observation of electromagnetic-induced transparency in gamma optics is proposed. For this purpose, the propagation of a resonant gamma photon in a  $^{57}\text{Fe}$  magnetic medium affected by an external radiofrequency (RF) field is considered. It is demonstrated that, in the case of crossing-anticrossing, a resonant RF field significantly transforms gamma-optical properties of the medium that become dependent on its parameters. This allows coherent control of the group velocity of gamma photons and controlled filtering of unpolarized gamma radiation in the sample to be realized. © Nauka/Interperiodica 2007.

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