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Peculiarities of two-colour optical superradiance in the LaF₃:Pr³⁺ crystal

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Abstract

We report the results of detailed investigation of optical superradiance (SR) in LaF₃:Pr³⁺ crystal resonantly excited on 3P₀-3H₄(0) transition by laser pulse. When the power of the pumping pulse was higher than a certain threshold, the resonant medium emitted an optical SR pulse on 3P₀-3H₄(0) transition in the direction of the pumping pulse (as well as in the opposite direction) delayed in time with respect to the pumping pulse. Further increasing of the peak power of the pumping pulse led to the observation of SR on the 3P₀-3H₆(1) transition also. Thus, the two-color SR in the employed crystal was observed.

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Keywords

Optical superradiance, Superfluorescence, Van-Vleck paramagnets