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Vacuum ultraviolet and ultraviolet fluorescence and absorption studies of Er3+-doped LiLuF4 single crystals

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Abstract

The laser induced fluorescence spectrum of LiLuF4:Er 3+ single crystals, pumped by an F2 pulsed discharge molecular laser at 157 nm, was obtained in the vacuum ultraviolet (VUV) and ultraviolet (UV) regions of the spectrum at room temperature. A number of new fluorescence peaks were observed for the first time. They were assigned to the dielectric dipole allowed transitions 4f105d→4f11 of the Er3+ ion. In addition, the absorption spectrum of the same crystal samples was recorded. The positions of the bands within the 4f 105d configuration were located at 65 098, 69 198, 71 422, 74 343, and 76 916 cm-1. The edge of the 4f105d bands was at 63 046 cm-1.

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