

## **VUV and UV fluorescence and absorption studies of $Tb^{3+}$ and $Tm^{3+}$ trivalent ions in $LiYF_4$ single crystal hosts**

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### **Abstract**

The laser induced fluorescence spectra of  $LiYF_4:Tb^{3+}$  (YLF: Tb) and  $LiYF_4:Tm^{3+}$  (YLF: Tm) single crystals, pumped by an F2 pulsed discharge molecular laser at 157 nm, were 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 dipole allowed transitions  $4f^75d \rightarrow 4f^8$  and  $4f^{11}5d \rightarrow 4f^{12}$  of  $Tb^{3+}$  and  $Tm^{3+}$  ions respectively. The absorption spectra of the same crystal samples in the VUV and UV regions were taken as well. The edge (onset) and the energy of the states with  $4f^{N-1}5d$  configuration were determined. © 1994 Taylor and Francis Ltd.

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