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Spectroscopic analogy approach in selective search for new Ce³⁺-activated all-solid-state tunable ultraviolet laser materials

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Abstract

Recent progress made with Ce³⁺-activated materials offers numerous advantages with respect to other traditional sources of tunable ultraviolet (UV) radiation; so there is a strong incentive for further aimed searches for new Ce³⁺-activated materials capable of lasing with wider continuous UV tunability using all-solid-state direct UV pumping. Here we report the spectroscopic analogy approach for further aimed searches derived from the analysis of known laser materials. We also report the results of our test investigation, based on the suggested approach, where Ce³⁺-activated SrAlF₅ is spectroscopically characterized as a promising all-solid-state tunable UV laser material which can be efficiently pumped by a quadrupled Nd laser.
