

## Spectrum analysis of U<sup>3+</sup>-doped LaBr<sub>3</sub> single crystals. Part 1: crystal-field analysis.

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Single crystals of U<sup>3+</sup>:LaBr<sub>3</sub> were grown by the Bridgman–Stockbarger technique. High-resolution polarized absorption spectra of the crystals were recorded at 4.2 K in the 4000–50,000 cm<sup>-1</sup> range. Sixty-four experimental crystal-field energy levels of the U<sup>3+</sup> ion were fitted to a semiempirical Hamiltonian employing free-ion, one-electron crystal-field as well as two-particle correlation crystal-field (CCF) operators with an r.m.s. deviation of 28 cm<sup>-1</sup>. The performed analysis of the spectra enabled the determination of crystal-field parameters and assignment of the observed 5f<sub>3</sub> → 5f<sub>3</sub> transitions. The effects of selected CCF operators on the splitting of some specific U<sup>3+</sup> multiplets have been investigated and the obtained values of Hamiltonian parameters are discussed and compared with those reported in previous analyses.

### Adres publiczny

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