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Enhanced superhyperfine structure of the EPR spectra of a U3+ ion introduced into the Van Vleck paramagnet LiTmF4

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Abstract

The observation of the superhyperfine structure (SHFS) in EPR spectra due to enhanced nuclear magnetism is reported. The X-band spectrum of a U 3+ ion introduced into the Van Vleck paramagnet LiTmF4 is measured in the temperature range of 5-20 K and compared with the spectra of LiLuF4:U3+ and LiYF4:U3+ single crystals. The spectra reveal well-resolved and strikingly different SHFS. The SHFS of Li(Lu, Y)F4:U3+ is due to the fluorine ions forming the nearest surroundings of the U3+ ion. The main contribution to the SHFS of the U3+ spectrum in LiTmF4 comes from the Tm3+ ions with a highly enhanced nuclear gyromagnetic tensor. © 2008 Pleiades Publishing, Ltd.

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