Investigation of saturation effects in ceramic phosphors for laser lighting - DTU Orbit
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We report observation of saturation effects in a Ce:LuAG and Eu-doped nitride ceramic phosphor for conversion of blue laser light for white light generation. The luminous flux from the phosphors material increases linearly with the input power until saturation effects limit the conversion. It is shown, that the temperature of the phosphor layer influences the saturation power level and the conversion efficiency. It is also shown that the correlated color temperature (CCT), phosphor conversion efficiency and color rendering index (CRI) are dependent both on incident power and spot size diameter of the illumination. A phosphor conversion efficiency up to 140.8 lm/W with CRI of 89.4 was achieved. The saturation in a ceramic phosphor, when illuminated by high intensity laser diodes, is estimated to play the main role in limiting the available luminance from laser based lighting systems.

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