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Luminescent Properties of Ca$_3$Sc$_2$Si$_3$O$_{12}$: Mn$^{2+}$ and Ce$^{3+}$ for a
White LED WILLIAM COGGINS, JESSICA LANG, LI MA, Physics Department
Georgia Southern Univ. — In this experiment, we studied the excitation and emis-
sion properties, as well as the fluorescence decay of the doubly doped Ca$_3$Sc$_2$Si$_3$O$_{12}$:
Mn$^{2+}$ and Ce$^{3+}$ phosphor. The phosphor is coated on a GaN LED chip, and the
Mn$^{2+}$ and Ce$^{3+}$ centers give red and green emissions, respectively, subject to the
blue excitation from the chip. Together with the transmitted blue light from the
LED chip, the system yields an ideal white light, with a potential application for
lighting. The red emission from Mn$^{2+}$ ions has a longer decay time than that of the
green emission from the Ce$^{3+}$. The color composition and stability along with the
input power have also been studied.

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