

Spectra Analysis in Sunset Color Demonstrations with a White-Color LED as a Light Source

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Abstract : Spectra of light beams emitted from white-color LED torches are different from those of conventional electric torches. In order to confirm if white-color LED torches can be used as light sources for popular sunset color demonstrations in spite of such differences, spectra of travelled light beams and scattered light beams with each of a white-color LED torch (composed of a blue LED and yellow-color fluorescent material) and a conventional electric torch as a light source were measured and compared with each other in a 50 cm-long water tank for sunset color demonstration experiments. Suspension liquid was prepared from acryl-emulsion and tap-water in the water tank, and light beams from the white-color LED torch or the conventional electric torch were allowed to travel in this suspension liquid. Sunset-like color was actually observed when the white-color LED torch was used as the light source in sunset color demonstrations. However, the observed colors when viewed with naked eye look slightly different from those obtainable with the conventional electric torch. At the same time, with the white-color LED, changes in colors in short to middle wavelength regions were recognized with careful observations. From those results, white-color LED torches are confirmed to be applicable as light sources in sunset color demonstrations, although certain attentions have to be paid. Further advanced classes will be successfully performed with white-color LED torches as light sources.

Keywords : blue sky demonstration, sunset color demonstration, white LED torch, physics education

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