

Abstract Submitted
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Enhancement of LED Backlight by Metallic Nanostructures¹ Y.D. YAO, J.K. WU, Department of Materials Engineering, Tatung University, C.Y. HSU, S.Y. HSU, P.K. WEI, Research Center for Applied Science, Academia Sinica, D.H. WEI, Department of Mechanical Engineering, National Taipei University of Technology, M.D. CHOU, C.N. MO, R & D Center, Chung Hwa Picture Tube, Ltd — Metallic nanostructures with different size on ITO coated glass substrates have been fabricated by using metal thin film dewetting, electron beam lithography, and nanosphere lithography techniques for studying the light guide in a display system. The increase of extraction efficiency is based on scattering light from the trapped photons. With Ag and Au nanostructures in peripheral area of emitting region on the ITO coated glass substrates, the external quantum efficiency of devices increases by roughly 14 % and with a 100 nm-width and 450 nm-period metallic nanowire structures, the light extraction can enhance up to 40 % from the glass substrate. We demonstrated that with a proper metallic nanostructure in the backlight system of a LED device, the extraction efficiency could be efficiently enhanced.

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