

**MIRROR BOX SKY SIMULATOR**

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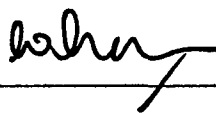
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This Final Year Project Report entitled “**Mirror Box Sky Simulator**” was submitted by Noorshuhaida Abu Bakar, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by



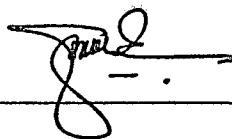
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## ABSTRACT

### Shah Alam Mirror Box Sky Simulator

This research was done to determine and evaluate the Shah Alam Mirror Box Sky Simulator. The objectives for this study are to develop mathematical model for the Shah Alam Sky, to compare the Shah Alam Sky Model with Nakamura Model and to calibrate a mirror box sky simulator based on the Shah Alam Sky Model. The Nakamura Model is  $L_p/L_z = (2+3\sin\theta)/5$  where  $\theta$  is the altitude angle from horizontal to the point P in the sky under consideration,  $L_p$  is the luminance value at point P and  $L_z$  is the luminance value at zenith (Z). The illuminances for sky simulator box were measured using luxmeter. Measurement were made for altitudes of  $0^\circ$ ,  $30^\circ$ ,  $40^\circ$ ,  $50^\circ$  and  $60^\circ$  and the azimuth angles of  $0^\circ$ ,  $90^\circ$ ,  $180^\circ$  and  $270^\circ$ . The measured illuminance data for sky simulator box were analyzed using Excel software and the models were produced using 'Curve Fitting' method. The mathematical equations for sky simulator were compared with Nakamura Model. The mathematical equation for sky simulator is  $L_p/L_z = 0.6+0.3\sin\theta$ .