

Comparative study of natural and artificial wind for thermal comfort studies

Abstract

Wind speed is widely known factor affecting human thermal perception and comfort. However, little is available about the dynamic characteristics of natural and artificial wind. Currently, some investigators addressed the dynamic aspect of natural and artificial wind speed for thermal comfort according to power spectrum slope. However, there is little information about the dynamic characteristics of wind direction (wind azimuth) and elevation. The aim of this study is to investigate some of the characteristics of natural versus artificial wind at various sampling time. Measurements of natural and artificial wind were made using ultrasonic anemometer. The study location is Kota Kinabalu, Malaysia. Wind speed, wind direction, wind elevation and air temperature are the recorded parameters. In the present case study, the artificial wind is referred to the indoor wind generated by air conditioning and USB fan simultaneously. Several differences were observed between natural and artificial wind at various sampling time. The power spectral slopes of natural wind speed, wind direction, wind elevation and air temperature were higher than the case of artificial wind.