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Summer indoor comfort levels in the Mediterranean area: the impact of different window configurations, natural ventilation and solar

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Estimation of sky Illuminance for Solar Energy Application in Malaysia

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Applications of solar energy in Malaysia can be classified into three categories; thermal, photovoltaic and daylighting systems. The availability and cost of energy have become dominant factors in Malaysian society today. Renewable energy is expected to cover a major part of the energy consumption. Malaysia must step up efforts to concentrate more in the applications of renewable energy. Research and development in solar thermal and photovoltaic technologies are already established in Malaysia. Some work has started in daylighting and modeling of daylight from solar irradiation and is building momentum. Daylight design in buildngs require local luminance, illuminance and radiance data. However, long term luminance and illuminance data have never been measured anywhere in Malaysia. Recently, attempts have been made by a local university to capture sky data. This paper reports on some preliminary work done to estimate illuminance from the Malaysian sky luminance and radiance data. The global luminous efficacy has been estimated to be 99.0 +1.0 lm/W. A comparison is also made with to the luminous efficacy estimated from previous work using limited data. More measurements need to be conducted in order to produce more realistic efficacy values, ultimately an empirical Malaysian Sky Model may be produced from these long term data.

Summer indoor comfort levels in the Mediterranean area the impact of different window configurations, natural ventilation and solar shading strategies on the indoor comfort level in simple rooms

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The case studied is related to a residential family house, which is a typical residential building in the South Mediterranean Sea. The house type is also representative for second home. It is a two-storey house that is assumed to be located in Rome. The objective of the research is to compare indoor comfort conditions of two kitchens (in which internal gains are defined taking into account a traditional use of the kitchen in Southern Italy) with different window configurations, natural ventilation and solar shading strategies to avoid overheating in summer. Both rooms have the same floor area and the same total window area. One kitchen has a facade window with shutter; the other kitchen has a facade window and two roof windows including shutters. The aim of the research is to ascertain the differences in indoor comfort, temperature, air flow and solar distribution for two window/shutter control regimes, in four main orientations and with different roof constructions. The simulation tool ESP-r from the University of Strathclyde has been used in the report and the ESP-r model has been verified by the University.This research project has been sponsored by VELUX A/S.