FIELD INVESTIGATION OF NIGHT RADIATION COOLING UNDER TROPICAL CLIMATE

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This paper discusses the feasibility of cooling by using night radiation under Thailand’s hot and humid climate. Four types of roof radiators were made by using common construction materials. They were examined under three sky conditions: clear, cloudy and rainy, respectively. Investigation was done, mainly, based on the temperature of different surfaces of a roof radiator. The experimental results showed that the depression of different surface temperatures is in the range of 1-6°C below ambient temperature under clear and cloudy skies. Under rainy skies, the temperature of different surfaces of roof radiators and ambient air was fairly close. Apart from sky conditions, the factors which affect the night radiation cooling are the thermal emissivity of materials and water condensation on the radiator surface area. Finally, this first study indicated that cooling by using night radiation is feasible mainly during tropical winter season.