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# Investigation of Night Cooling Event, Experimental Radiator

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**Abstract :** In the hot climate countries, especially those countries with great desert area, such as Iran, a considerable part of the energy is consumed due to cooling and air conditioning system in a hot season. So it is important to find a renewable energy supply for cooling systems. Although, there are few consistent researches in this field of renewable energy in compare with other fields. This research is presenting a study on performance of a night cooling radiator and working fluid storage for night time operation and day time resting periods. In these experiments, we didn't expose any heating load but focused only on the possibility of system combination and its potential cooling effect. A very simple radiator has been designed in south of Iran, Shiraz, in order to perform this study. The radiator has been insulated with polystyrene foam and bubbled plastic sheets have been used as top cover. Using a single bubbled plastic sheet, the radiator temperature reached 0°C which is 20°C lower than minimum ambient temperature. Putting a small storage tank in the line increased the radiator's minimum temperature at night; however, provided some cool fluid source for hot days of Shiraz that easily reaches 40°C. The results have shown very good cooling potential without heating load and acceptable temperature increasing during hot day with a small, short term storage tank. Future studies can make the system more effective and applicable.

**Keywords :** night cooling, experimental set up, cooling radiator, chill storage
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