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Experimental study of GSHP system for space cooling and heating: A case study of Tunisia

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The work focuses on testing the potential of geothermal energy for space heating in the climatic conditions of northern Tunisia, by assessing the performance of ground source heat pump (GSHP). This is to solve a problem of high energy consumption in the residential sector in Tunisia. Therefore, an experimental platform consisting of ground heat exchanger coupled to a geothermal heat pump, which is in turn connected to a test room is also constructed and tested at the Center for Research and Technology Energy, Borj Cédria. The profitability of air conditioning by the direct use of geothermal surface is tested. The test of the geothermal heat pump for air conditioning using two types of emission: The radiant floor cooling (RFC) and the chilled ceiling panel system (CCP) as well as the air heating are experimented. This work is an introduction to the study of the performance of geothermal installations and in particular the profitability of geothermal heat pumps for air conditioning for Tunisian climate. The results found show that the exploitation of geothermal energy is a promising solution for reducing energy consumption of air conditioning in Tunisia.

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