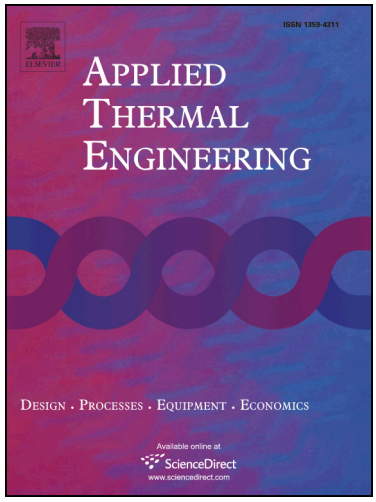

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A geothermal recycling system for cooling and heating in deep mines

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Highlights

- In this paper, we present a geothermal recycling system (GRSM) for cooling and heating mines.
- Compared to other types of cooling systems, the COP（coefficient of performance）of this GRSM cooling subsystem is 30% higher than that of others.
- The COP of the GRSM heating subsystem is 20% higher with the parallel running of cooling and heating systems.

ABSTRACT： In the operation of deep coal mines, cooling systems must be built (in most cases) because of the high-temperature working environment within such mines. Once the coal is mined, it is often used to supply heat for buildings and domestic hot water. In either instance, the energy consumed can create environmental pollution. As a potential solution to this problem, we present a geothermal recycling system for mines (GRSM) for parallel mine cooling and surface heating. The performance of this system is investigated based on the observed data. Compared with traditional cooling systems, the most obvious feature of this system is the removal of a cooling tower, which contributes to a 30% increase in performance. Moreover, the parallel running of cooling and heating systems can effectively recover waste heat, improving energy efficiency by 20%.

Keywords： coal mine; cooling system; geothermal; thermal analysis

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