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COMPREHENSIVE OPTIMIZATION OF THE EVA SPACESUIT CCHP SYSTEM

Abstract

Purpose The performance of the EVA spacesuit combined cooling-heating-power (CCHP) system depends on many parameters. More than one parameter has great influence on the performance of the EVA spacesuit CCHP system, and more than one performance index needs to be optimized. The purpose of this article is, with the help of multi-parameters optimization method, carrying out comprehensive optimization study for the design and operating parameters of the EVA spacesuit CCHP system. **Method** The evaluation models of the mass, volume and consumable loss of the EVA spacesuit CCHP system were built up, then the optimization objective functions were established, finally, genetic algorithm and ant colony algorithm were used to find out the optimal parameter set of the CCHP system. **Result** The results show that, contrast to the non-optimized parameter set, the optimized parameter set provides obvious advantage on comprehensive performance. **Conclusion** Genetic algorithm and ant colony algorithm can be used for the optimization of the EVA spacesuit CCHP system, and they offer significant effects.