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The optimal flow rate for parallel flow multi-stream heat exchangers

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A high performance heat exchanger is a critical component in a cryogenic system and its performance is typically very sensitive to the axial conduction, the parasitic heat loads and property variations. This paper presents a general 1-D model for multi-stream plate-fin parallel flow heat exchanger. The governing equations are solved by both analytical method and numerical method. The results show that there exists the optimal flow rate, which is corresponding to the maximum efficiency, for the same heat exchangers, the same working fluids, the same inlet temperature and the same inlet pressure for each fluid.

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