Optimization of an Inverse Convection Solution Strategy

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Abstract

Keywords: Inverse Problems, Computational Heat Transfer, Convection

1. Introduction

Thermal-fluid systems often create situations where the engineering problem is an inverse heat transfer problem. These problems often have limited physical access, very limited to no boundary condition knowledge, and/or limited domain knowledge.

For example, an optical fiber drawing furnace wall temperature distribution cannot be directly measured due to shape, inaccessibility, and high temperatures. Issa et al. [1] developed a regularization technique to solve for the distribution using only the furnace centerline temperature distribution.

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2. Experimental System

3. Numerical Simulations

4. Inverse Solution Methodology

5. Results and discussions

6. Conclusions

References

[1] J. Issa, Z. Yin, C. E. Polymeropoulos, Y. Jaluria, Temperature distribution in an optical fiber draw tower furnace, Journal of Materials Processing and Manufacturing Science vol 4 (1996) 221–232.