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Turbulent Impinging Jets into Porous Materials

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Preface

For more than two decades now, at the Instituto Tecnológico de Aeronáutica (ITA), Brazil, I have taught courses on thermal sciences. In the middle of the 1990s, we got interested in the subject of modeling flows through permeable structures. Besides the most promising realm of applications for such studies, namely Oil and Gas industries, other promising areas such as Energy, Aeronautics, Aerospace and Defense, became also target for new applied technology to be developed based on the fundamentals detailed in several journal articles and books published on this subject by our group.

Among many applications that we foresaw in years back, was the possibility of enhancing or damping heat transfer rates from surfaces subjected to heating or cooling by an impinging jet. Then, a series of systematic studies were carried out describing the advantages, or otherwise, of having a solid porous matrix attached to a surface that is hit by a fluid. This book intends to present such studies in a self contained and organized way.

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São José dos Campos, December 2011 Marcelo J.S. de Lemos