

Accepted Manuscript

Shear work contribution to convective heat transfer of dilute gases in slip flow regime

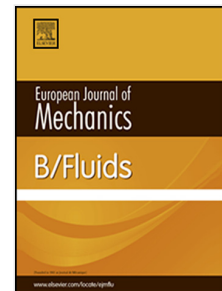
Pamela Vocale, Gian Luca Morini, Marco Spiga, Stéphane Colin

PII: S0997-7546(16)30124-8

DOI: <http://dx.doi.org/10.1016/j.euromechflu.2016.12.004>

Reference: EJMFLU 3107

To appear in: *European Journal of Mechanics B/Fluids*



Please cite this article as: P. Vocale, G.L. Morini, M. Spiga, S. Colin, Shear work contribution to convective heat transfer of dilute gases in slip flow regime, *European Journal of Mechanics B/Fluids* (2016), <http://dx.doi.org/10.1016/j.euromechflu.2016.12.004>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

SHEAR WORK CONTRIBUTION TO CONVECTIVE HEAT TRANSFER OF DILUTE GASES IN SLIP FLOW REGIME

Pamela Vocale^{a*}, Gian Luca Morini^b, Marco Spiga^a, Stéphane Colin^c

^aDepartment of Industrial Engineering, University of Parma, Parco Area delle Scienze 181/A, 43124

Parma, Italy

^bDIN - Alma Mater Studiorum Università di Bologna, Viale Risorgimento 3, 40135 Bologna, Italy

^cUniversité de Toulouse - Institut Clément Ader (ICA), 3 rue Caroline Aigle, 31400 Toulouse, France

HIGHLIGHTS

- A comprehensive theoretical analysis of the convective heat transfer in presence of a dilute gas with non-negligible viscous dissipation is presented.
- Modified boundary conditions coupled to the energy balance equation are not needed for dilute gases in order to take into account the effect of the shear work on the Nusselt number.
- The adoption of the modified boundary condition leads to an underestimation or an overestimation of the Nusselt numbers depending on the values of Brinkman number and on the channel cross section geometry.

Download English Version:

<https://daneshyari.com/en/article/4992390>

Download Persian Version:

<https://daneshyari.com/article/4992390>

[Daneshyari.com](https://daneshyari.com)