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Wei Huang, Rui-Rui Zhang, Li Yan, Min Ou, R. Moradi

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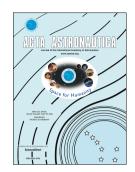
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## ACCEPTED MANUSCRIPT

1	Numerical experiment on the flow field properties of a blunted body with a counterflowing
2	jet in supersonic flows
3	Wei Huang <sup>1*</sup> , Rui-rui Zhang <sup>1</sup> , Li Yan <sup>1</sup> , Min Ou <sup>1</sup> , R. Moradi <sup>2</sup>
4	1. Science and Technology on Scramjet Laboratory, National University of Defense Technology, Changsha,
5	Hunan 410073, People's Republic of China
6	2. Department of Chemical Engineering, School of Engineering & Applied Science, Khazar University, Baku,
7	Azerbaijan
8	
9	Abstract: The prediction of the drag and heat flux reduction characteristics is a very important issue in the
10	conceptual design phase of the hypersonic vehicle. In this paper, the flow field properties around a blunted body
11	with a counterflowing jet in the supersonic flow with the freestream Mach number being 3.98 were investigated
12	numerically, and they are obtained by means of the two-dimensional axisymmetric Reynolds-averaged
13	Navier-Stokes (RANS) equations coupled with the two equation standard k-ɛ turbulence model. The surface
14	Stanton number distributions, as well as the surface static pressures, were extracted from the flow field
15	structures in order to evaluate the drag and heat flux reduction characteristics. Further, the influences of the jet
16	pressure ratio and the jet Mach number on the drag and heat flux reduction were analyzed based on the detailed
17	code validation and grid independency analysis process. The obtained results show that the flow cell Reynolds
18	number has a great impact on the heat flux prediction, and its best value is 5.0 for the case studied in the current
19	study. However, the flow cell Reynolds number and the grid scale both have only a slight impact on the
20	prediction of the surface static pressure distribution, as well as the turbulence model. The larger jet pressure
21	ratio is beneficial for the drag and heat flux reduction, and the smaller jet Mach number is beneficial for the heat

<sup>\*</sup> Corresponding author, Associate Professor, E-mail: <u>gladrain2001@163.com</u>, Phone: +86 731 84576447

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