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License Agreement

for the CFD Test Case HT-1

Heat Transfer in High Aspect Ratio Cooling Channels with H₂ and CH₄

The test data of this test case was generated by Dr.-Ing. Jan Haemisch during his doctorate project (2013 – 2020) under the scientific supervision of Univ.-Prof. Dr. rer.nat. M. Oswald in the Combustion Chamber Technology Group of Dr. Dmitry Suslov at the DLR Institute of Space Propulsion in Lampoldshausen, Germany.

The test case "HT-1" is open to everyone, who wants to use the data base for CFD validation. The provision of this test case is intended to be a contribution to the field of research on heat transfer in the cooling channels of regeneratively cooled rocket combustors. The provider of the test case highly appreciates to share results, experience and other useful information among the group of users and encourages all users to participate in that sense. Joint publications are welcome.

The test case consists of two documents:

- (1) the Test Case Description
- (2) the Test Case Data Set.

By signing this license agreement the user accepts:

- to not give access to anybody else to the contents of the test case description and test case data set
- to not distribute the contents of the test case and test case data set to third parties
- that he does not gain any rights on the obtained data or any other information on the test case.
- to cite in every publication (or in any other form of communication) the source and origin of his information, i.e. naming the authors and the institute. If the test case is used in any form of publication, the relevant publications below must be cited. Furthermore, the origin of the data base must be mentioned as follows: "The measurements on the test case "HT-1" were carried out at the Institute of Space Propulsion at the German Aerospace Center in Lampoldshausen,

Germany.“

- to give feedback to the Institute of Space Propulsion at the German Aerospace Center in Lampoldshausen about what he did with the provided information. Participation in the potential workshops and inclusion of these results in the data base are solicited and welcome.

After the signed License Agreement has been received by the contact at DLR listed below the detailed Test Case Description and the Test Case Data Set will be made available to the licensee.

Relevant publications of the test case:

- [1] J. Haemisch, D. Suslov, M. Oswald: “Experimental Investigations of Heat Transfer Processes in Cooling Channels for Cryogenic Hydrogen and Methane at Supercritical Pressure”, In: di Mare F., Spinelli A., Pini M. (eds) Non-Ideal Compressible Fluid Dynamics for Propulsion and Power. NICFD 2018. Lecture Notes in Mechanical Engineering. Springer, Cham. https://doi.org/10.1007/978-3-030-49626-5_1
- [2] J. Haemisch, D. Suslov, M. Oswald: “Experimental and Numerical Investigation of Heat Transfer Processes in Rocket Engine Cooling Channels Operated with Cryogenic Hydrogen and Methane at Supercritical Conditions”, 32nd International Symposium on Space Technology and Science (ISTS) Conference, Fukui city, Japan 2019
- [3] J. Haemisch, D. Suslov, M. Oswald: “Experimental Study of Methane Heat Transfer Deterioration in a Subscale Combustion Chamber”, Journal of Propulsion and Power, Vol. 35, No.4, 2019, <https://doi.org/10.2514/1.B37394>
- [4] J. Haemisch, “Wärmeübergang von Wasserstoff und Methan in Kühlkanälen regenerativ gekühlter Schubkammern kryogener Raketentriebwerke“, Dissertation, RWTH Aachen University, Germany, 2020

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CFD Test Case

HF-7: LOX/H2-Combustion with self-sustained acoustic excitation

License Agreement

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