

Vol. 14 No. 2
June 2011

ISSN: 1301-9724
e-ISSN: 2146-1511
www.ijoticat.com

International Journal of Thermodynamics

Editor-in-Chief

M. R. von Spakovsky

Honorary Editors

A. Bejan

M. J. Moran

J. Szargut

G. Tsatsaronis

A. Valero

Abstracting and Indexing: Chemical Abstracts Services, Copernicus, DOAJ, EBSCO, Engineering Index, Google Scholar, Scopus, and ULAKBIM



*International Centre for
Applied Thermodynamics*

International Journal of Thermodynamics

Editor-in-Chief:

Michael R. von SPAKOVSKY

Department of Mechanical Engineering
Virginia Polytechnic Inst. and State U.
Blacksburg, Virginia 24061, USA
vonspako@vt.edu

Associate Editor-in-Chief

Derek K. BAKER

Department of Mechanical Engineering
Middle East Technical University
Ankara 06531, TURKEY
dbaker@metu.edu.tr

Associate Editors

Yaşar DEMİREL

Department of Chemical and Biomolecular Engr.
University of Nebraska Lincoln
Lincoln, Nebraska, USA
ydemirel2@unlnotes.unl.edu

Andrea LAZZARETTO

Department of Mechanical Engineering
University of Padova
Padova, ITALY
andrea.lazzaretto@unipd.it

Verda VITTORIO

Politecnico di Torino
Dipartimento di Energetica (DENER)
Torino, ITALY
vittorio.verda@polito.it

Board of Editors

A. Ö. ARNAS

Dept. of Civil and Mechanical Engr.
United States Military Academy
West Point, New York, USA

C. FRANGOPOULOS

Dept. of Naval Architecture and Marine Engineering,
National Technical University of Athens
Zografou, GREECE

S. NEBRA

Inter. Centre for Energy Planning – NIPE
University of Campinas – UNICAMP
Campinas, São Paulo State, BRAZIL

R. BANERJEE

Dept of Energy Science and Engineering
IIT Bombay
Powai, Mumbai, INDIA

A. HERNÁNDEZ-GUERRERO

Mechanical Engineering Department
Universidad de Guanajuato
Salamanca, Gto., MEXICO

S. OLIVEIRA JR

Mechanical Engr. Dept., Polytechnic School
University of São Paulo
São Paulo, SP, BRAZIL

G. P. BERETTA

Mechanical Engineering Department
University of Brescia
Brescia, ITALY

M. KOKSAL

Department of Mechanical Engineering
Hacettepe University
Ankara, TURKEY

E. SCIUBBA

Università degli Studi di Roma "La Sapienza"
Dipartimento di Meccanica e Aeronautica
Roma, ITALY

E. ÇUBUKÇU

Aktel Yapı San. ve Tic. Ltd. Şti.
Ankara, TURKEY

Z. LI

Department of Thermal Engineering
Tsinghua University
Beijing, P. R. CHINA

L. M. SERRA

Mech. Eng. Dept -Aragón Inst. Eng. Res. (I3A)
University of Zaragoza
Zaragoza, Spain

A. N. EĞRİCAN

Department of Mechanical Engineering
Yeditepe University
İstanbul, TURKEY

G. MANFRIDA

Dipartimento di Energetica "Sergio Stecco"
Università Degli Studi di Firenze
Firenze, ITALY

W. STANEK

Institute of Thermal Technology
Silesian University of Technology
Gliwice, POLAND

D. FAVRAT

Industrial Energy Systems Laboratory
Ecole Polytechnique Fédérale de Lausanne
Lausanne, SWITZERLAND

P. MATHIEU

Dept. of Nuclear Engr. and Power Plants
Université de Liège, Institut de Mécanique
Liège, BELGIUM

J. TESTER

School of Chem Engr and Biomolecular Engr
Cornell University
Ithaca, New York, USA

M. FEIDT

L.E.M.T.A., Université Henri Poincaré,
Nancy 1 2, Avenue de la Forêt de Haye
Vandœuvre-les-Nancy, Cedex, FRANCE

H. METGHALCHI

Mechanical and Industrial Engr. Department
Northeastern University
Boston, Massachusetts, USA

D. TONDEUR

Lab Réactions et Génie des Procédés du CNRS
Université de Lorraine at NANCY
Nancy, FRANCE

Honorary Editorial Advisory Board

A. BEJAN, Duke University, NC, USA

M. J. MORAN, Ohio State University, OH, USA

J. SZARGUT, Technical University of Silesia, POLAND

G. TSATSARONIS, Technische Universität Berlin, GERMANY

A. VALERO, University of Zaragoza, SPAIN

Past Editor-in-Chief

A. Ö. ARNAS, US Military Academy, NY, USA (1998-2001)

Past Associate Editors-in-Chief

Y. A. GÖĞÜŞ, Middle East Technical University, TURKEY (1998-2004)

T. YEŞİN, Middle East Technical University, TURKEY (2004-2008)

M. KOKSAL, Hacettepe University, TURKEY (2009-2010)

Online Administrator: **O. TAYLAN**, University of Texas-Austin, USA, otaylan@mail.utexas.edu

Author Service Department: For queries relating to the general submission of articles (including electronic text and artwork) and the status of accepted manuscripts, please contact the Author Service Department: Fax: +90 (216) 578 0331, info@icatweb.org.

Uluslararası Uygulamalı Termodinamik Derneği Adına,

İmtiyaz Sahibi:

A. Nilüfer EĞRİCAN

Sorumlu Yazı İşleri Müdürü:

Kerem ERÇOŞKUN

Yönetim Yeri: Yeditepe Üniversitesi, Kayışdağı Cad., Ataşehir, İstanbul, **Tel:** +90 (216) 578 0602, **Faks:** +90 (216) 578 0331, **e-mail:** info@icatweb.org

Basım Yeri: Mor Ajans Reklam, Abidei Hürriyet C. R. Yurdakul Sok. Köşe Palas A. No:6/1 Şişli, İstanbul **Tel:** +90 (212) 343 0401, **e-mail:** mor@morajansreklam.com

(← Blank 14 pt Line →)

(← Blank 14 pt Line →)

General Information for Authors (Paper Title: 14 pt and Mixed Case)

(← Blank 10 pt Line →)

Authors: Initials Last Name* (11 pt)

(← Blank 10 pt Line →)

Author Affiliation Line 1 (10 pt)

Author Affiliation Line 2(10 pt)

E-mail: ¹abc@xyz.com (10 pt)

(← Blank 10 pt Line →)

Abstract (Bold, indent left and right margins 0.5 cm)

(← Blank 10 pt Line →)

The abstract should be short and approximately 200 words. The format is a single column using 10 pt Times New Roman font, left and right margins indented 0.5 cm, single spacing, and justified.

(← Blank 10 pt Line →)

Keywords: *Keyword 1; keyword 2; keyword 3; keyword 4.* (italics, indent left and right margins 0.5 cm, the title “Keywords:” is bold, while the actual keywords are not bold. Capitalize the 1st keyword but not subsequent keywords. Separate words by a semi-colon and conclude with a period.)

(← Blank 10 pt Line →)

1. Aims and Scope (Headings: Bold, full justified)

The purpose and scope of the International Journal of Thermodynamics is to provide a forum for the publication of original theoretical and applied work in the field of thermodynamics as it relates to systems, states, processes, and both non-equilibrium and equilibrium phenomena at all temporal and spatial scales. The journal, thus, provides a multidisciplinary and international platform for the dissemination to academia and industry of both scientific and engineering contributions, which touch upon a broad class of disciplines that are foundationally linked to thermodynamics and the methods and analyses derived there from. A common thread throughout is that of assessing how both the first and particularly the second laws of thermodynamics touch upon these disciplines.

(← Blank line between body and header→)

2. Paper Organization and Format

2.1 Length and Organization

Papers should not exceed 8-10 pages and should be structured as follows: Abstract; Introduction; Methodology or similar; Results or similar; Conclusions; Acknowledgements; Nomenclature; and, References.

2.2 Fonts and Dimensions

The primary dimensions for the paper are summarized in Table 1. A two-column format is used for the body. Times New Roman with 10 pt font should be used throughout the body of the paper except for the header, title, author names, and footer as noted. The body should be

Table 1. Dimensions for IJoT Papers.

Dimension	Value
Paper	A4 (21 cm x 29.7 cm)
Margins (Top, Bottom, Left, Right)	1.5 cm
Gutter	0.50 cm
Column Width	8.5 cm
Space between columns	0.5 cm
Header	1 cm
Footer	1 cm
Paragraph Indentation	0.5 cm

single spaced and justified. The first line of all paragraphs should be indented 0.5 cm and single spacing between all paragraphs should be used.

2.3 Tables and Figures

All table and figure titles are in italics and conclude with a period as shown in Table 1 and Figure 1. Single line titles are centered while multi-line titles are justified. In the body of the paper, refer to figures and tables using the full word “Table 1” and “Figure 1.” All figures and tables must fit within the margins and should not include borders. Large figures and tables can span both columns and must be at the top or bottom of a page. Font sizes of 8 or 10 are appropriate for figures and tables. It is important that all text in Figures and Tables be legible. See Section 3.4 Use of Color for line titles are justified. In the body of the paper, refer to figures and tables using the full word “Table 1” and “Figure 1.” All figures and tables must fit within the margins and should not include borders. Large figures and tables can span both columns and must be at the top or bottom of a page. Font sizes of 8 or 10 are appropriate for Figures and Tables. It is important that all text in Figures and Tables be legible. See Section 3.4 Use of Color for information about color figures. Figures printed in grayscale for the print paper and in color for the online paper should include “(Figure is in color in online version of paper)” in the title as shown in Figure 1.

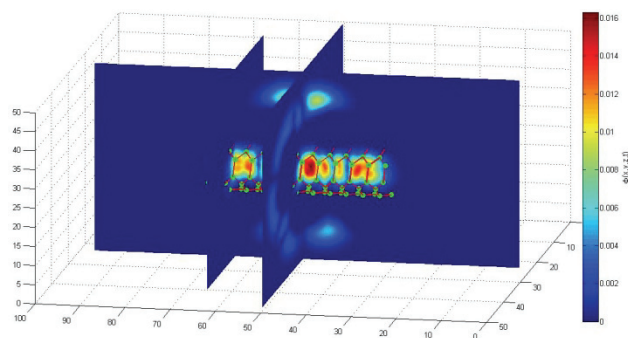


Figure 1. Sample figure (Figure is in color in the on-line version of the paper).

Table 2. Formatting for Equations.

Font Size (pt)		Font Style	
Full	10	Variable	Times New Roman (<i>Italics</i>)
Subscript / Superscript	7	Number, Text,	
Sub-subscript / Super-superscript	6	Function, Matrix, Vector	Times New Roman (Plain)
Symbol	14	L.C. and U.C. Greek	Symbol
Sub-Symbol	10	Symbol	Symbol (Bold)

2.4 Equations

All equations should be formatted as in Table 2. Equations are left justified and have a right justified equation number in parenthesis. Justify all equation numbers using a right justified tab; do not use left justified tabs, spaces, or tables. Within the body, refer to specific equations using the abbreviation “Eq. (1)”, “Eqs. (2), (4) and (5)” and “Eqs. (2)-(5)”.

A sample equation is

$$V = \frac{mRT(t)}{p} \quad (1)$$

where V , m , t and p are variables, R is a constant, and T is a function. If an equation is too long to fit on a single line, continue the equation on the next line.

2.5 Use of Color

All IJoT issues are published in both hardcopy and online versions. Unless the author pays for color publishing costs, the hardcopy version will be in grayscale while the online version will be in color. See Section 2.3 Tables and Figures for instructions on how to include grayscale figures for the hardcopy and color figures for the online paper.

2.6 Citation and References

All papers published in IJoT are assigned a unique Digital Object Identifier (DOI), which integrates IJoT papers into a larger web of DOI enabled sources based on references. Integration of IJoT papers into this larger DOI web requires that all IJoT papers follow the APA Citation and Reference Style (American Psychological Association, 2010). The general format for citations with N authors is (Last Name 1, Last Name 2,... & Last Name N , Year) or Last Name 1, Last Name 2,... & Last Name N (Year), where the last names can be placed inside or outside the parenthesis. For one or two authors, list all authors in all citations. For three to five authors, list all authors in the first citation (Rahim, Far, Parsinejad, Andrews & Metghalchi, 2008) and use et al. for all subsequent citations (Rahim et al., 2008). For six or more authors, list the first author's name followed by et al. in the citation and the first 7 authors followed by et al. in the reference list; e.g., a sample citation and reference for a report with 9 authors is (Hoffer et al., 2004). Separate multiple citations by a semi-colon order alphabetically (Bejan, 1997; Beretta, 1981). When two or more references would have the same identification, distinguish them by appending "a", "b", etc to the year of publication (Dimopoulos & Frangopoulos, 2008a, 2008b). When referring to an entire website, include the address in the citation (www.icatweb.org) and do not include in the reference list.

Specific reference examples found in the References Section of this document are as follows:

- Book: (Bejan, 2007);
- Conference article: (Heidary, Davoudi, & Kermani, 2010);
- Dissertation: (Beretta, 1981);
- Journal article, in press with DOI number: (Taylan, Baker, & Kaftanoglu, in press);
- Journal article, online with DOI number: (Spasojević, Janković, & Djaković, 2010);
- Journal article, printed: (Dimopoulos & Frangopoulos, 2008a);
- Report (Hoffer et al., 2004);
- Web site, general (www.icatweb.org);
- Web site, specific document or page with no date (“Author Guidelines,” n.d.).

Detailed reference formats for other types of documents are readily available on the web (e.g. www.apastyle.org/learn/faqs/).

3. Publishing in IJoT

3.1 Costs

IJoT does not charge any authors fees unless the author requests the hardcopy version of their paper be printed in color. See Section 2.5 Use of Color for more information. As an Open Access Journal, all IJoT papers are freely available on the web, which increases the impact of papers published in IJoT.

3.2 File Types Supported

Word: IJoT fully supports submissions in Word.

LaTeX: The IJoT editorial staff is currently developing LaTeX publishing capabilities. A draft of a LaTeX template can be made available to authors using LaTeX. However, until this template is complete authors using LaTeX are expected to provide a publishable pdf file of their paper formatted according to IJoT standards.

Other: IJoT can support other file types to the extent that authors do all the formatting and supply a publishable pdf file of their paper formatted according to IJoT standards.

3.3 Submission

Submit papers online at www.ijotocat.com. Before submitting the corresponding authors must first register. To maintain a quality review process while avoiding charging author fees, IJoT authors are asked to support IJoT by reviewing 3 papers. Therefore while registering authors must check *Reviewer* and list reviewing interests. Each manuscript must be accompanied by a statement that the paper has not been published elsewhere nor has it been submitted for publication elsewhere. Under certain circumstances papers published in conference proceedings can be considered for publication. Technical Notes are also accepted for review and publication.

3.4 Review

Papers are sent to at least three reviewers. At least two consistent reviews are required before the review process can be concluded.

3.5 Publishing

After a paper is accepted, the authors are responsible for formatting their paper according to these guidelines and editing for proper English. Special attention should be paid to the Citation and Reference requirements in Section 2.6. IJoT reserves the right not to publish any accepted paper that is not properly formatted and edited.

Once the formatting and editing for a paper is complete, the paper is assigned a unique Digital Object Identifier (DOI) and immediately published online before the paper is assigned to a specific issue. Early online publication reduces the time to publication and allows other researchers to immediately benefit from papers published in IJoT. By assigning a paper a DOI, the paper becomes integrated into a larger web of DOI enabled sources, making it easier for other researchers to find relevant papers published in IJoT and therefore increasing the impact of papers published in IJoT. After early online publication, papers are typically assigned to a specific volume and issue within 1-6 months.

Acknowledgements:

(List any acknowledgments here.)

Nomenclature

(The nomenclature should include appropriate SI (metric) dimensions for the variables used. Acronyms should also be placed in alphabetical order.)

References:

- American Psychological Association. (2010). *Publication manual of the American Psychological Association*. (6th ed.). Washington DC: American Psychological Association.
- Author Guidelines (n.d.). Retrieved September 20, 2010, from www.ehajem.com/index.php/IJoT/about/submissions#authorGuidelines.
- Bejan, A. (1997). *Advanced Engineering Thermodynamics*, (2nd ed.). New York, NY: Wiley-Interscience.
- Beretta, G. P. (1981). *On the General Equation of Motion of Quantum Thermodynamics and the Distinction*

between Quantal and Nonquantal Uncertainties (Doctoral dissertation), MIT, Cambridge, MA.

- Dimopoulos, G. G., Frangopoulos, C. A. (2008a). A Dynamic Model for Liquefied Natural Gas Evaporation During Marine Transportation. *Int. J. of Thermodynamics*, 11(3), 123-131.
- Dimopoulos, G. G., Frangopoulos, C. A. (2008b). Thermo-economic Simulation of Marine Energy Systems for a Liquefied Natural Gas Carrier. *Int. J. of Thermodynamics*, 11(4), 195-201.
- Heidary, H., Davoudi, M., & Kermani, M. (2010). Effect of Buoyancy Driven Stream Loop Numbers on Heat Transfer and Entropy Generation. *IMECE 2009: Proceedings of the ASME International Mechanical Engineering Congress and Exposition, vol 9, pts A-C*, 691-699.
- Hoffer, T. B., Selfa, L., Welch, Jr., V., Williams, K., Hess, M., Friedman, J., Reyes, S., et al. (2004). Doctorate Recipients from United States Universities: Summary Report 2003. NORC at the University of Chicago.
- Rahim, F., Far, K. E., Parsinejad, F., Andrews, R. J. & Metghalchi, H. (2008). A Thermodynamic Model to Calculate Burning Speed of Methane-Air- Diluent Mixtures. *Int. J. of Thermodynamics*, 11(4), 151-160.
- Spasojević, M. D., Janković, M. R., Djaković, D. D. (2010), A New Approach to Entropy Production Minimization in Diabatic Distillation Column with Trays. *Thermal Science*, 14(2), pp. 317-328, DOI: 10.2298/TSCI1002317S.
- Taylan, O., Baker, D. K., Kaftanoglu, B. (in press), COP trends for ideal thermal wave adsorption cooling cycles with enhancements, *International Journal of Refrigeration*, DOI: 10.1016/j.ijrefrig.2010.07.008.
- Zanchini, E., & Beretta, G. P. (2010). Removing Heat and Conceptual Loops from the Definition of Entropy. *Int. J. of Thermodynamics*, 13(2), 67-76.