Hasanudin Hasanudin <hasanudin@mipa.unsri.ac.id>

[IJRER] Request to Serve as a Manuscript Reviewer

1 pesan

Prof. Dr. Ilhami COLAK <ijrereditor@gmail.com> 7 Oktober 2022 pukul 19.20
Kepada: Hasanudin Hasanudin <hasanudin@mipa.unsri.ac.id>

Dear Hasanudin Hasanudin:

The manuscript entitled "Numerical investigation of the energetic-exergetic quasi-dynamic performance of mini-channel solar air heaters," has been submitted to the International Journal of Renewable Energy Research (IJRER). I would greatly appreciate your serving as a reviewer on this manuscript. You will find the abstract of this manuscript at the bottom of this e-mail. I hope that you will consider undertaking this important task for us.

Please log into the journal web site by 2022-10-14 to indicate whether you will undertake the review or not, as well as to access the submission and to record your review and recommendation. The web site is https://www.ijrer.org/ijrer/index.php/ijrer

The review is due 2022-10-25itself .

If you do not have your username and password for the journal's web site, you can use this link to reset your password (which will then be emailed to you along with your username).
https://www.ijrer.org/ijrer/index.php/ijrer/login/resetPassword/hasanudin?confirm=ce74040736560f7921bb7732a187ebd91751e649c60bad5223812fa63045eba5%3A1665152454

Submission URL:
https://www.ijrer.org/ijrer/index.php/ijrer/reviewer/submission/25743?key=EAQBzkpQ

In addition, please feel free to include your reviewing role as "I am the Reviewer of International Journal of Renewable Energy" on your international web site.

Thank you in advance for your assistance.
Sincerely,

Prof. Dr. Ilhami COLAK
Gazi University,
Editor-in-Chief, IJRER
Phone +90312212111719
Fax +90312212111719
ijrereditor@gmail.com
IJRER is cited in SCOPUS

"Numerical investigation of the energetic-exergetic quasi-dynamic performance of mini-channel solar air heaters"

Abstract

Mini-channel solar air heaters (SAHs) are good candidates for implementation in hot air production fields due to their simple design and favorable performance and operational characteristics. In this paper, a numerical investigation of the energetic-exergetic performance of various mini-channel SAH absorber configurations is introduced using 3D CFD (computational fluid dynamics) analysis and under quasi-dynamic conditions. Three glass-covered

mini-channel SAH absorber designs were investigated: a flat absorber with rectangular channels (RSAH), a tubular-channel absorber (TSAH) and a V-corrugated triangular channel absorber (VSAH). The performance analysis results are obtained and compared for all absorber configurations, including the simple, single-channel type solar air heater (SSAH). The developed CFD collector model was validated against available experimental data for the tubular mini-channel geometry. Hourly solar radiation values were calculated and meteorological data for Cairo, Egypt were obtained and coupled to the CFD model, based on typical seasonal days of the year (Mar. 20, Jun. 21, Sep. 23 and Dec. 22). In order to highlight the absorber configuration of the best thermo-hydraulic performance, an energetic and exergetic performance analysis was performed. The maximum accumulative useful heat energy was achieved by the VSAH collector with average yearly increases of 79.42%, 6.42% and 29.69% as compared to SSAH, RSAH and TSAH, respectively. In addition, the average seasonal daily efficiency range for this type of collectors is 34.10%-41.32% as compared to 19.08%-22.78% for the SSAH type with an average increase of 79.73%. The average seasonal daily exergy efficiency range for this type of collectors is 1.60%-2.25% as compared to 0.49%-0.68% for the SSAH type with an average increase of 229.59%. Among all mini-channel collector configurations, VSAH collectors recorded the maximum collected annual energy of 1183.3 kWh/m2/y with an increase of 79.42% as compared to collected annual energy using SSAH collectors.

International Journal of Renewable Energy Research-IJRER
http://www.ijrer.org
ijrereditor@gmail.com
IJRER is cited in SCOPUS, EBSCO and ESCI (Thomson Reuters)

Hasanudin Hasanudin <hasanudin@mipa.unsri.ac.id>

[IJRER] Submission Review Reminder

1 pesan

Prof. Dr. Ilhami COLAK <ijrereditor@gmail.com> 19 Oktober 2022 pukul 19.01
Kepada: Hasanudin Hasanudin <hasanudin@mipa.unsri.ac.id>

Hasanudin Hasanudin:

Just a gentle reminder of our request for your review of the submission, "Numerical investigation of the energetic-exergetic quasi-dynamic performance of mini-channel solar air heaters," for International Journal of Renewable Energy Research (IJRER). We are hoping to have this review by 2022-10-25, and will be pleased to receive it as soon as you are able to prepare it.

Submission URL:
https://www.ijrer.org/ijrer/index.php/ijrer/reviewer/submission/25743?key=JDqT3qjk

Please confirm your ability to complete this vital contribution to the work of the journal. I look forward to hearing from you.

Prof. Dr. Ilhami COLAK
Gazi University,
Editor-in-Chief, IJRER
Phone +90312212111719
Fax +90312212111719
ijrereditor@gmail.com
IJRER is cited in SCOPUS

International Journal of Renewable Energy Research-IJRER
http://www.ijrer.org
ijrereditor@gmail.com
IJRER is cited in SCOPUS, EBSCO and ESCI (Thomson Reuters)

International Journal of Renewable Energy Research-IJRER

#13445 Review

Submission To Be Reviewed

Title	Numerical investigation of the energetic-exergetic quasi-dynamic performance of mini-channel solar air heaters
Journal Section	Articles

Abstract

Mini-channel solar air heaters (SAHs) are good candidates for implementation in hot air production fields due to their simple design and favorable performance and operational characteristics. In this paper, a numerical investigation of the energetic-exergetic performance of various mini-channel SAH absorber configurations is introduced using 3D CFD (computational fluid dynamics) analysis and under quasi-dynamic conditions. Three glass-covered mini-channel SAH absorber designs were investigated: a flat absorber with rectangular channels (RSAH), a tubular-channel absorber (TSAH) and a V-corrugated triangular channel absorber (VSAH). The performance analysis results are obtained and compared for all absorber configurations, including the simple, single-channel type solar air heater (SSAH). The developed CFD collector model was validated against available experimental data for the tubular mini-channel geometry. Hourly solar radiation values were calculated and meteorological data for Cairo, Egypt were obtained and coupled to the CFD model, based on typical seasonal days of the year (Mar. 20, Jun. 21, Sep. 23 and Dec. 22). In order to highlight the absorber configuration of the best thermo-hydraulic performance, an energetic and exergetic performance analysis was performed. The maximum accumulative useful heat energy was achieved by the VSAH collector with average yearly increases of 79.42%, 6.42% and 29.69% as compared to SSAH, RSAH and TSAH, respectively. In addition, the average seasonal daily efficiency range for this type of collectors is 34.10%-41.32% as compared to 19.08%-22.78% for the SSAH type with an average increase of 79.73%. The average seasonal daily exergy efficiency range for this type of collectors is 1.60%-2.25% as compared to 0.49%-0.68% for the SSAH type with an average increase of 229.59%. Among all mini-channel collector configurations, VSAH collectors recorded the maximum collected annual energy of 1183.3 kWh/m^2/y with an increase of 79.42% as compared to collected annual energy using SSAH collectors.

Submission Editor	Ilhami COLAK

Submission Metadata	VIEW METADATA

Review Schedule

Editor's Request	2022-10-07
Your Response	2022-10-07
Review Submitted	2022-10-25
Review Due	2022-10-25

Review Steps

1. Notify the submission's editor as to whether you will undertake the review.
   Response Accepted

2. Click on file names to download and review (on screen or by printing) the files associated with this submission.

Submission Manuscript	13445-43100-1-RV.DOCX	2022-09-16
Supplementary File(s)	None	

3. Click on icon to fill in the review form.
   Review Form

4. In addition, you can upload files for the editor and/or author to consult.
   Uploaded files None

5. Select a recommendation and submit the review to complete the process. You must enter a review or upload a file before selecting a recommendation.
   Recommendation **Revisions Required** 2022-10-25

Online ISSN: 1309-0127

Publisher: Gazi University

IJRER is cited in SCOPUS, EBSCO, WEB of SCIENCE (Clarivate Analytics);

IJRER has been cited in Emerging Sources Citation Index from 2016 in web of science.

WEB of SCIENCE between 2019-2021;

h=27,

Average citation per item=5.19

Impact Factor=(1409+1606+1660)/(204+189+170)=8.3

International Journal of Renewable Energy Research-IJRER

Review Form Response

Article Review Form

Is the paper of sufficient originality to warrant publication in the journals? *

- (●) Yes
- ( ) No

Is the paper clearly and sensibly arranged? *

- (●) Yes
- ( ) No

Are the analyses and conclusions a logical outcome of the data and discussion?

(If this is not the case, please outline)

*

- (●) Yes
- ( ) No

Quality and clarity of the writing *

- ( ) Poor
- ( ) Fair
- (●) Neutral
- ( ) Good
- ( ) Excellent

Relevance of the topic for renewable energy researches
*

- ( ) Poor
- ( ) Fair
- ( ) Neutral
- ( ) Good
- (●) Excellent

Constructive feedback for the author(s) *

This article is interesting in modeling solar air heaters systems, and is recommended for publication in this journal, with some improvements first.

Editor Section (not returned to the author)

(Please accompany this report with any detailed comments)

*

- ○ Accept
- ○ Accept pending minor revisions
- ◉ Accept pending major revisions
- ○ Reject

Comments for the editor (not to be shared with the author(s) *

Thank you for giving the best experience in reviewing articles from your journal. Hopefully your journal will be of better quality in the future

Save Close

* Denotes required field

Hasanudin Hasanudin <hasanudin@mipa.unsri.ac.id>

[IJRER] Article Review Acknowledgement

1 pesan

Prof. Dr. Ilhami COLAK <ijrereditor@gmail.com> 26 Oktober 2022 pukul 04.49
Kepada: Hasanudin Hasanudin <hasanudin@mipa.unsri.ac.id>

Hasanudin Hasanudin:

Thank you for completing the review of the submission, "Numerical investigation of the energetic-exergetic quasi-dynamic performance of mini-channel solar air heaters," for International Journal of Renewable Energy Research (IJRER). We appreciate your contribution to the quality of the work that we publish.
Please feel free to include your reviewing role as "I am the Reviewer of International Journal of Renewable Energy" on your international web site.

Prof. Dr. Ilhami COLAK
Gazi University,
Editor-in-Chief, IJRER
Phone +90312212111719
Fax +90312212111719
ijrereditor@gmail.com
IJRER is Cited in SCOPUS, EBSCO and Web of Science (Clarivate Analytics)

International Journal of Renewable Energy Research-IJRER
http://www.ijrer.org
ijrereditor@gmail.com
IJRER is cited in SCOPUS, EBSCO and ESCI (Thomson Reuters)

International Journal of Renewable Energy Research-IJRER

Numerical investigation of the energetic-exergetic quasi-dynamic performance of mini-channel solar air heaters

Ahmed Aboulmagd, Hesham Othman, Ahmed ElDegwy

Abstract

Mini-channel solar air heaters (SAHs) are good candidates for implementation in hot air production fields due to their simple design and favorable performance and operational characteristics. In this paper, a numerical investigation of the energetic-exergetic performance of various mini-channel SAH absorber configurations is introduced using 3D CFD (computational fluid dynamics) analysis and under quasi-dynamic conditions. Three glass-covered mini-channel SAH absorber designs were investigated: a flat absorber with rectangular channels (RSAH), a tubular-channel absorber (TSAH) and a V-corrugated triangular channel absorber (VSAH). The performance analysis results are obtained and compared for all absorber configurations, including the simple, single-channel type solar air heater (SSAH). The developed CFD collector model was validated against available experimental data for the tubular mini-channel geometry. Hourly solar radiation values were calculated and meteorological data for Cairo, Egypt were obtained and coupled to the CFD model, based on typical seasonal days of the year (Mar. 20, Jun. 21, Sep. 23 and Dec. 22). In order to highlight the absorber configuration of the best thermo-hydraulic performance, an energetic and exergetic performance analysis was performed. The maximum accumulative useful heat energy was achieved by the VSAH collector with average yearly increases of 79.42%, 6.42% and 29.69% as compared to SSAH, RSAH and TSAH, respectively. In addition, the average seasonal daily efficiency range for this type of collectors is 34.10%-41.32% as compared to 19.08%-22.78% for the SSAH type with an average increase of 79.73%. The average seasonal daily exergy efficiency range for this type of collectors is 1.60%-2.25% as compared to 0.49%-0.68% for the SSAH type with an average increase of 229.59%. Among all mini-channel collector configurations, VSAH collectors recorded the maximum collected annual energy of 1183.3 kWh/m^2/y with an increase of 79.42% as compared to collected annual energy using SSAH collectors.

Keywords

CFD; solar; air; heater; mini-channel; absorber; energy; exergy; performance

Full Text:

PDF

References

J. C. McVEIGH, "Water and Air Heating Applications," Sun Power, vol. 1982, no. 97, pp. 25–64, 1983, doi: 10.1016/b978-0-08-026147-8.50009-5.

K. S. Ong, "Thermal performance of solar air heaters-Experimental correlation," Sol. Energy, vol. 55, no. 3, pp. 209–220, 1995, doi: 10.1016/0038-092X(95)00027-O.

R. Hastings, Solar Air Systems A Design Handbook, 1st ed. Routledge, 2000.

L. B. Y. Aldabbagh, F. Egelioglu, and M. Ilkan, "Single and double pass solar air heaters with wire mesh as packing bed," Energy, vol. 35, no. 9, pp. 3783–3787, 2010, doi: 10.1016/j.energy.2010.05.028.

A. A. El-Sebaii, S. Aboul-Enein, M. R. I. Ramadan, S. M. Shalaby, and B. M. Moharram, "Thermal performance investigation of double pass-finned plate solar air heater," Appl. Energy, vol. 88, no. 5, pp. 1727–1739, 2011, doi: 10.1016/j.apenergy.2010.11.017.

C. D. Ho, Y. E. Tien, and H. Chang, "Performance improvement of a double-pass V-corrugated solar air heater under recycling operation," Int. J. Green Energy, vol. 13, no. 15, pp. 1547–1555, 2016, doi: 10.1080/15435075.2016.1206004.

Siddhartha, N. Sharma, and Varun, "A particle swarm optimization algorithm for optimization of thermal performance of a smooth flat plate solar air heater," Energy, vol. 38, no. 1, pp. 406–413, 2012, doi: 10.1016/j.energy.2011.11.026.

A. S. Yadav and J. L. Bhagoria, "A CFD (computational fluid dynamics) based heat transfer and fluid flow analysis of a solar air heater provided with circular transverse wire rib roughness on the absorber plate," Energy, vol. 55, pp. 1127–1142, 2013, doi: 10.1016/j.energy.2013.03.066.

R. Nowzari, L. B. Y. Aldabbagh, and F. Egelioglu, "Single and double pass solar air heaters with partially perforated cover and packed mesh," Energy, vol. 73, pp. 694–702, 2014, doi: 10.1016/j.energy.2014.06.069.

R. Nowzari, N. Mirzaei, and L. B. Y. Aldabbagh, "Finding the best configuration for a solar air heater by design and analysis of experiment," Energy Convers. Manag., vol. 100, pp. 131–137, 2015, doi: 10.1016/j.enconman.2015.04.058.

A. O. Dissa, S. Ouoba, D. Bathiebo, and J. Koulidiati, "A study of a solar air collector with a mixed 'porous' and 'non-porous' composite absorber," Sol. Energy, vol. 129, pp. 156–174, 2016, doi: 10.1016/j.solener.2016.01.048.

S. Singh, "Performance evaluation of a novel solar air heater with arched absorber plate," vol. 114, pp. 879–886, 2017.

I. Singh, S. Vardhan, S. Singh, and A. Singh, "Experimental and CFD analysis of solar air heater duct roughened with multiple broken transverse ribs: A comparative study," Sol. Energy, vol. 188, no. April, pp. 519–532, 2019, doi: 10.1016/j.solener.2019.06.022.

S. Chamoli, R. Lu, D. Xu, and P. Yu, "Thermal performance improvement of a solar air heater fitted with winglet vortex generators," Sol. Energy, vol. 159, no. November 2017, pp. 966–983, 2018, doi: 10.1016/j.solener.2017.11.046.

P. Promthaisong and S. Eiamsa-ard, "Fully developed periodic and thermal performance evaluation of a solar air heater channel with wavy-triangular ribs placed on an absorber plate," Int. J. Therm. Sci., vol. 140, no. October 2018, pp. 413–428, 2019, doi: 10.1016/j.ijthermalsci.2019.03.010.

H. Hassan, S. Abo-Elfadl, and M. F. El-Dosoky, "An experimental investigation of the performance of new design of solar air heater (tubular)," Renew. Energy, vol. 151, pp. 1055–1066, 2020, doi: 10.1016/j.renene.2019.11.112.

P. T. Saravanakumar, D. Somasundaram, and M. M. Matheswaran, "Exergetic investigation and optimization of arc shaped rib roughened solar air heater integrated with fins and baffles," Appl. Therm. Eng., vol. 175, no. April, 2020, doi: 10.1016/j.applthermaleng.2020.115316.

S. Singh, S. Mitra, M. Kumar, and S. Suman, "Thermal performance evaluation of a solar air heater with rotating turbulators," Sustain. Energy Technol. Assessments, vol. 48, p. 101647, 2021, doi: https://doi.org/10.1016/j.seta.2021.101647.

A. Kumar and A. Layek, "Energetic and exergetic based performance evaluation of solar air heater having winglet type roughne?? on absorber surface," Sol. Energy Mater. Sol. Cells, vol. 230, no. November 2020, 2021, doi: 10.1016/j.solmat.2021.111147.

K. Nidhul, A. K. Yadav, S. Anish, and S. Kumar, "Critical review of ribbed solar air heater and performance evaluation of various V-rib configuration," Renew. Sustain. Energy Rev., vol. 142, no. March, 2021, doi: 10.1016/j.rser.2021.110871.

D. Preda, "STANDARDIZATION OF SOLAR AIR HEATERS," Australia, 2017. [Online]. Available: http://www.q-solar.com/.

A. A. Razak et al., "Review on matrix thermal absorber designs for solar air collector," Renew. Sustain. Energy Rev., vol. 64, pp. 682–693, 2016, doi: https://doi.org/10.1016/j.rser.2016.06.015.

H. S. Arunkumar, K. Vasudeva Karanth, and S. Kumar, "Review on the design modifications of a solar air heater for improvement in the thermal performance," Sustain. Energy Technol. Assessments, vol. 39, p. 100685, 2020, doi: https://doi.org/10.1016/j.seta.2020.100685.

C. Mund, S. K. Rathore, and R. K. Sahoo, "A review of solar air collectors about various modifications for performance enhancement," Sol. Energy, vol. 228, pp. 140–167, 2021, doi: https://doi.org/10.1016/j.solener.2021.08.040.

ANSYS Inc., "ANSYS-Fluent." 2020, [Online]. Available: https://www.ansys.com/products/fluids/ansys-fluent.

EUROPEAN COMMITTEE FOR STANDARDIZATION, "Thermal solar systems and components-Solar collectors-Part 2: test methods (EN 12975-2)." EUROPEAN COMMITTEE FOR STANDARDIZATION, 2006.

European Commission Joint Research Centre, "Photovoltaic Geographical Information System (PVGIS)," PVGIS 5.2. https://re.jrc.ec.europa.eu/pvg_tools/en/.

Z. Zhang, W. Zhang, Z. J. Zhai, and Q. Y. Chen, "Evaluation of various turbulence models in predicting airflow and turbulence in enclosed environments by CFD: Part 2—comparison with experimental data from literature," HVAC R Res., vol. 13, no. 6, pp. 871–886, 2007, doi: 10.1080/10789669.2007.10391460.

J. A. Duffie and William A. Beckman, Solar Engineering of Thermal Processes, Fourth Edi. Hoboken, New Jersey: John Wiley & Sons, Inc., 2013.

K. Altfeld, "PART I : THE CONCEPT OF NET EXERGY FLOW AND THE MODELING OF SOLAR AIR HEATERS," vol. 41, no. 2, pp. 127–132, 1988.

M. Abu?ka, "Energy and exergy analysis of solar air heater having new design absorber plate with conical surface," Appl. Therm. Eng., vol. 131, pp. 115–124, 2018, doi: https://doi.org/10.1016/j.applthermaleng.2017.11.129.

DOI (PDF): https://doi.org/10.20508/ijrer.v12i4.13445.g8619

Refbacks

- There are currently no refbacks.

Online ISSN: 1309-0127

Publisher: Gazi University

IJRER is cited in SCOPUS, EBSCO, WEB of SCIENCE (Clarivate Analytics);

IJRER has been cited in Emerging Sources Citation Index from 2016 in web of science.

WEB of SCIENCE between 2019-2021;

h=27,

Average citation per item=5.19

Impact Factor=(1409+1606+1660)/(204+189+170)=8.3