frontiers | Frontiers in Energy Research

TYPE Editorial
PUBLISHED 18 January 2024
DOI 10.3389/fenrg.2023.1361118

OPEN ACCESS

EDITED AND REVIEWED BY
Shripad T. Revankar,
Purdue University, United States

*CORRESPONDENCE
Deqi Chen,
chendeqi@cqu.edu.cn

RECEIVED 25 December 2023
ACCEPTED 31 December 2023
PUBLISHED 18 January 2024

CITATION
Chen D, Ding W and Chen L (2024), Editorial: Complex flow and heat transfer in advanced nuclear energy systems.
Front. Energy Res. 11:1361118.
doi: 10.3389/fenrg.2023.1361118

Editorial: Complex flow and heat transfer in advanced nuclear energy systems

Deqi Chen[1]*, Wei Ding[2] and Lin Chen[3]

[1]Key Laboratory of Low-grade Energy Utilization Technologies and Systems (Ministry of Education), Chongqing University, Chongqing, China, [2]Helmholtz Center Dresden-Rossendorf, Helmholtz Association of German Research Centres (HZ), Dresden, Germany, [3]Institute of Engineering Thermophysics, Chinese Academy of Sciences (CAS), Beijing, China

KEYWORDS

nuclear energy, heat transfer, tow-phase flow, experiment, simulation

Editorial on the Research Topic
Complex flow and heat transfer in advanced nuclear energy systems

Nuclear energy is a crucial source of energy supply worldwide and is essential for achieving carbon neutrality. This is particularly true for advanced nuclear energy systems. In these systems, the complexity of flow and the efficiency and stability of heat transfer present ongoing challenges that necessitate further research efforts. In this specialized Research Topic entitled "Complex Flow and Heat Transfer in Advanced Nuclear Energy Systems," a Research Topic of related research works, including experimental research and numerical simulation works were gathered.

Li et al. conducted research focusing on condensation and acoustic characteristics of steam condensation. They experimentally studied the complex two-phase flow regimes and acoustic characteristics of direct contact condensation when steam is injected into water.

Liu et al. carried out numerical simulations on heat transfer of supercritical pressure water in a helical tube. This process occurs in a supercritical steam generator, which may potentially be used for future high-temperature gas-cooled reactors.

In the research carried out by Wang et al., an intriguing method was intruded to study the dynamic microlayer behavior during bubble growth in pool boiling. This was achieved by synchronizing high-speed laser interferometry with a high-speed camera, which provided detailed information on bubble growth.

Also, Lv et al. presented experimental results on bubble behavior in flow boiling with a narrow fully transparent rectangular channel, including the heating wall. Detailed bubble behavior has been obtained by a high-speed camera.

This Research Topic has garnered positive responses from numerous investigators in this field, resulting in the publication of four papers following rigorous peer review. We would like to express our gratitude to all the reviewers, and authors for their great

contributions to this Research Topic. We also greatly, appreciate the support from the editorial office of Frontiers in Energy Research.

Author contributions

DC: Writing–original draft, Writing–review and editing. WD: Writing–review and editing. LC: Writing–review and editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note