EDITORIAL

Reservoir Science: A Multi-Coupling Communication Platform to Promote Energy Transformation, Climate Change and Environmental Protection

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Abstract

***Reservoir Science* (RS) journal represents a significant milestone in the pursuit of energy extraction, energy storage, and the multifarious effects of climate change, which are influenced by the dual factors of global climate variability and energy scarcity. Concurrently, *Reservoir Science* is dedicated to the dissemination of innovative modules and research domains pertaining to energy extraction, energy storage, reservoir environment and greenhouse gas storage. Furthermore, the field of *Reservoir Science* encompasses the exploitation of geothermal energy, hydrocarbons (petroleum, hydrates) and hydrogen energy within reservoirs. The research scope of *Reservoir Science* encompasses not only the domain of reservoir energy storage, which falls under the purview of energy storage engineering, but also that of carbon storage science. Finally, the question of environmental impact on reservoirs during energy extraction and storage is a fundamental aspect of *Reservoir Science* journal.**

Keywords: energy extraction, energy storage, reservoir environment, climate protection, mining engineering.

It is with great enthusiasm that the inaugural issue of *Reservoir Science* (RS) is hereby presented. This important frontier is dedicated to the dissemination of innovative modules and research fields related to energy extraction, energy storage, reservoir environment and greenhouse gas storage. In the context of the dual threats of energy shortage and climate disorder worldwide, innovative exploration of reservoir energy and storage of greenhouse gases have become important measures to alleviate the current energy crisis and climate hazards. The objective of *Reservoir Science* is to establish a forum in which geological engineers, material engineers, energy scientists and environmental engineers can collaborate to innovate and develop new solutions pertaining to energy extraction, energy storage and climate change at the geological reservoir.

Reservoir Science (RS) focuses on the following research areas:

1 Reservoir Energy Extraction

The efficient exploitation of reservoir energy encompasses both traditional energy sources and new

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energy technologies. Firstly, the focus of reservoir science is on the exploitation of traditional energy sources. Innovative research in this field, including experimental evaluation, numerical simulation and analytical dynamics of oil, natural gas and natural gas hydrates in geological reservoirs, may be accorded priority consideration by reservoir science journals. Concurrently, the geological exploitation of coal reservoirs constitutes a significant augmentation to the existing stable supply of energy. Consequently, these associated research articles should be incorporated into the deliberations of reservoir science journals.

Moreover, the ongoing exploitation of non-renewable fossil fuels will inevitably exacerbate the prevailing energy deficit, offering no viable solution to the fundamental challenges posed by the energy crisis. The increasing recognition and exploration of renewable energy sources, such as geothermal energy and hydrogen energy from reservoirs, can be attributed to the pressing issues of global warming and energy shortages. These energy sources have a significant potential to supplement and, over time, replace traditional energy sources. Concurrently, the preface of reservoir science journals also encompasses articles in the field of materials related to geothermal energy exploitation, including the modification of geothermal energy transmission media and the chemical energy conversion of reservoir hydrogen energy.

2 Energy storage engineering and Carbon storage engineering

When energy storage equipment cannot effectively store electric or potential energy converted from new energy sources such as wind, solar and hydropower, a large amount of energy can be converted into heat energy and stored in geological reservoirs. These measures can effectively alleviate the disadvantages of current low-energy storage equipment, enabling new energy sources to be utilised more effectively. In addition, the global carbon storage project aimed at combatting the greenhouse effect is bound to make the use of geological reservoirs for CCUS an important issue, providing an innovative solution to the current greenhouse effect.

3 Reservoir Environmental Engineering

The process of fossil energy mining, along with that of energy storage engineering and carbon storage engineering, involves the synergistic enhancement of numerous chemicals. These chemicals may exert chemical effects on the environment of the reservoir in question, and this may be evident in a number of ways, including alterations to reservoir permeability, changes in reservoir water and alterations to reservoir rock adsorption. It is inevitable that the *Reservoir Science* (RS) journal will dedicate significant attention to research in the domain of environmental pollution of reservoirs.

Welcome to *Reservoir Science*, we look forward to working with you to shape the future of Energy Engineering, Carbon Storage Engineering and Environmental Engineering.

Yours sincerely,

Founding Editor-in-Chief

Reservoir Science

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Conflicts of Interest

The author declares no conflicts of interest.

Ethical Approval and Consent to Participate

Not applicable.

Qiang Li obtained his Ph.D. in Oil and Gas Field Development Engineering from China University of Petroleum (East China) in 2021. From 2021 to 2024, he was enrolled at the School of Science, Heilongjiang Bayi Agricultural University. Thereafter, from 2024, he commenced employment at the Faculty of Engineering, China University of Petroleum-Beijing at Karamay. His research interests primarily concentrate on the transformation of unconventional shales into reservoirs, the use of CCUS (Carbon Capture, Utilisation and Storage) in reservoir exploitation, and the exploitation of natural gas hydrates. As of 2025, the author had published 29 articles of a high quality, including nine ESI highly cited papers (Top 1%) and 10 ESI hot papers (Top 0.1%). Furthermore, he fulfils the role of editorial board member for two publications: The Open Chemical Engineering Journal and Asian Journal of Water, Environment and Pollution. (Email: liqiang202403@cupk.edu.cn)