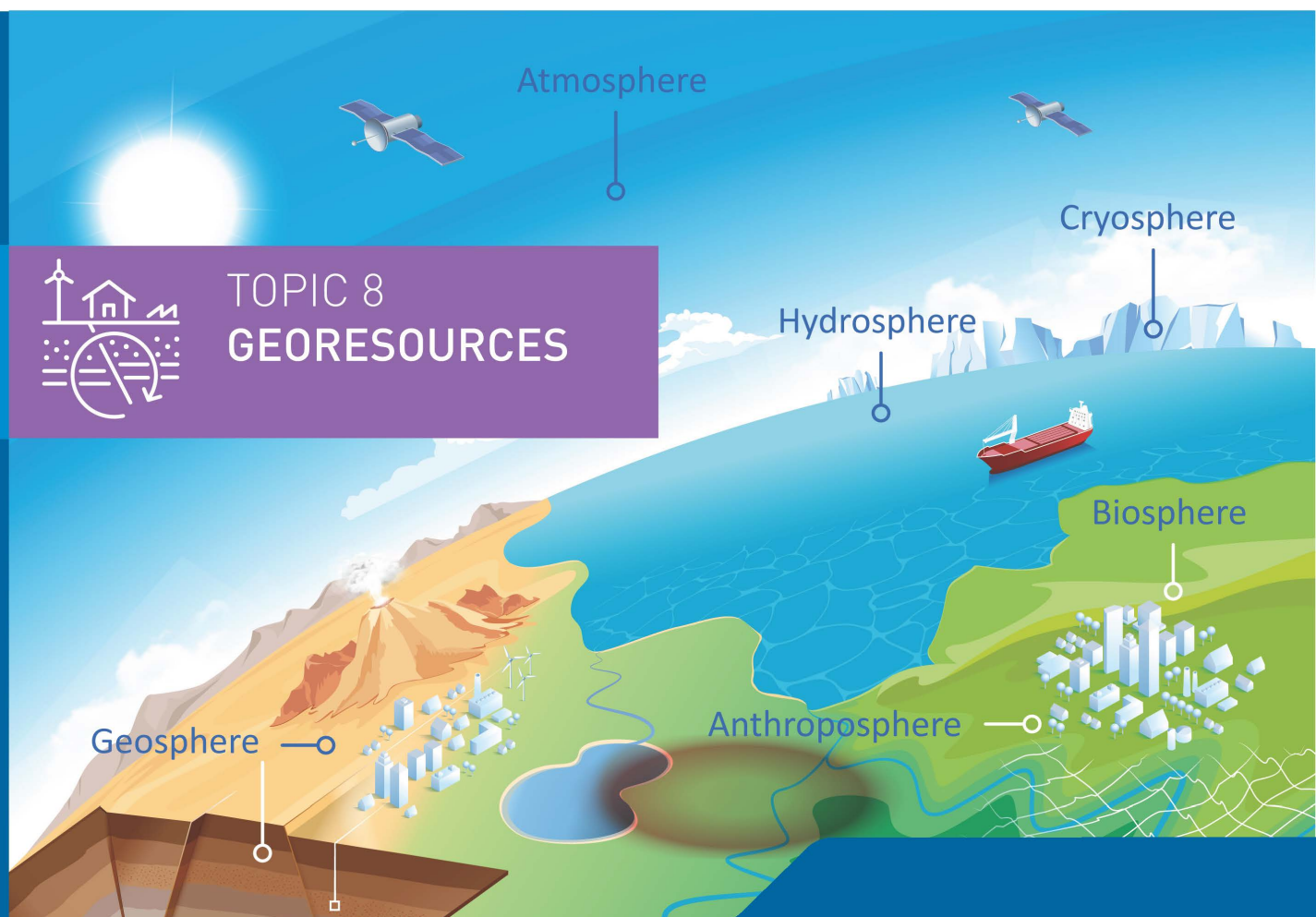




Publications

Helmholtz Centre for Environmental Research – UFZ

Topic 8: Georesources for the Energy Transition and a High-Tech Society

Preface

This list includes all publications of the year 2024 assigned to program topic 8 “Georesources for the Energy Transition and a High-Tech Society” of the Helmholtz research program "Changing Earth – Sustaining our Future" within the research field Earth and Environment which were authored, co-authored or edited by staff members of the Helmholtz Centre for Environmental Research - UFZ.

If a publication belongs to more than one program topic, both primary and secondary assignments are indicated.

The editorial deadline for this publication list was 28 February 2025.

In contrast to external authors, UFZ staff names are highlighted in **bold type** in all publications.

The concluding index lists all UFZ authors in alphabetical order with the sequential numbers of their publications.

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Publications in ISI/Scopus listed journals/series

1. **Altendorf, D., Wienkenjohann, H., Berger, F.,** Dehnert, J., Grünewald, H., Naumov, D., **Trabitzsch, R., Weiß, H.** (2024):
Successful reduction of indoor radon activity concentration via cross-ventilation: experimental data and CFD simulations
Isot. Environ. Health Stud. **60** (1), 74 - 89 [10.1080/10256016.2023.2282686](https://doi.org/10.1080/10256016.2023.2282686)
2. **Buchwald, J., Kolditz, O.,** Nagel, T. (2024):
Design-of-Experiment (DoE) based history matching for probabilistic integrity analysis—A case study of the FE-experiment at Mont Terri
Reliab. Eng. Syst. Saf. **244**, art. 109903 [10.1016/j.ress.2023.109903](https://doi.org/10.1016/j.ress.2023.109903)
3. Churakov, S.V., Claret, F., Idiart, A., Jacques, D., Govaerts, J., **Kolditz, O.,** Prasianakis, N.I., Samper, J. (2024):
Position paper on high fidelity simulations for coupled processes, multi-physics and chemistry in geological disposal of nuclear waste
Environ. Earth Sci. **83** (17), art. 521 [10.1007/s12665-024-11832-7](https://doi.org/10.1007/s12665-024-11832-7)
4. Claret, F., Prasianakis, N.I., Baksay, A., Lukin, D., Pepin, G., Ahusborde, E., Amaziane, B., Bátor, G., Becker, D., Bednár, A., Béreš, M., Bérešová, S., Böthi, Z., Brendler, V., Brenner, K., Březina, J., Chave, F., Churakov, S.V., Hokr, M., Horák, D., Jacques, D., Jankovský, F., Kazymyrenko, C., Koudelka, T., Kovács, T., Krejčí, T., Kruis, J., Laloy, E., Landa, J., Ligurský, T., Lipping, T., López-Vázquez, C., Masson, R., Meeussen, J.C.L., **Mollaali, M.,** Mon, A., Montenegro, L., Pisani, B., Poonoosamy, J., Pospiech, S.I., Saâdi, Z., Samper, J., Samper-Pilar, A.-C., Scaringi, G., Sysala, S., **Yoshioka, K.,** Yang, Y., Zuna, M., **Kolditz, O.** (2024):
EURAD state-of-the-art report: development and improvement of numerical methods and tools for modeling coupled processes in the field of nuclear waste disposal
Front. Nucl. Eng. **3**, art. 1437714 [10.3389/fnuen.2024.1437714](https://doi.org/10.3389/fnuen.2024.1437714)
5. **Graebli, N., Althaus, M., Şen, Ö.O.,** Reimann, T., Cajuhi, T., Scheuermann, G., **Kolditz, O., Rink, K.** (2024):
“Feels like an Indie Game” – Evaluation of a virtual field trip prototype on radioactive waste management research for university education
IEEE Comput. Graph. Appl. **44** (1), 13 - 24 [10.1109/MCG.2023.3328169](https://doi.org/10.1109/MCG.2023.3328169)
6. **Graebli, N.,** Ziefle, G., Furche, M., Nicol, R., Schefer, S., Ziegler, M., Jaeggi, D., Nussbaum, C., Annanias, Y., **Goldstein, S., Rink, K.** (2024):
VR-EX - An immersive virtual reality serious game for science communication about the electrical resistivity tomography measurements in the Mont Terri Rock Laboratory, Switzerland
Environ. Earth Sci. **83** (10), art. 318 [10.1007/s12665-024-11613-2](https://doi.org/10.1007/s12665-024-11613-2)

7. **Keller, N.S., Lüders, K., Hornbruch, G., Birnstengel, S., Vogt, C., Ebert, M., Kallies, R., Dahmke, A., Richnow, H.H.** (2024):
Rapid consumption of dihydrogen injected into a shallow aquifer by ecophysiologicaly different microbes
Environ. Sci. Technol. **58** (1), 333 - 341 [10.1021/acs.est.3c04340](https://doi.org/10.1021/acs.est.3c04340)
Main topic T7; Secondary topics T8, T5

8. **Koedel, U., Dietrich, P., Herrmann, T., Liang, C., Ritter, O., Roettenbacher, J., Schuetze, F.M., Schuetze, S.V., Thoboell, J.C., Schuetze, C.** (2024):
Enhancing citizen science impact in environmental monitoring: Targeted engagement strategies with stakeholder groups
Front. Environ. Sci. **12**, art. 1375675 [10.3389/fenvs.2024.1375675](https://doi.org/10.3389/fenvs.2024.1375675)
Main topic T5; Secondary topic T8

9. **Kolditz, O., Birkholzer, J.T., Ye, W.-M., Wang, X., Lippmann-Pipke, J.** (2024):
Clay rocks — characterization of natural and engineered barriers. Introductory editorial to the topical collection
Environ. Earth Sci. **83** (21), art. 610 [10.1007/s12665-024-11908-4](https://doi.org/10.1007/s12665-024-11908-4)

10. **Kolditz, O., Hünken, U., Dietrich, P.** (2024):
Sustainable utilization of geosystems: editorial to the topical collection
Environ. Earth Sci. **83** (21), art. 612 [10.1007/s12665-024-11914-6](https://doi.org/10.1007/s12665-024-11914-6)

11. **Kolo, I., Brown, C.S., Nibbs, W., Cai, W., Falcone, G., Nagel, T., Chen, C.** (2024):
A comprehensive review of deep borehole heat exchangers (DBHEs): subsurface modelling studies and applications
Geotherm. Energy **12**, art. 19 [10.1186/s40517-024-00297-3](https://doi.org/10.1186/s40517-024-00297-3)

12. **Kurgyis, K., Achtziger-Zupančič, P., Bjorge, M., Boxberg, M.S., Broggi, M., Buchwald, J., Ernst, O.G., Flügge, J., Ganopolski, A., Graf, T., Kortenbruck, P., Kowalski, J., Kreye, P., Kukla, P., Mayr, S., Miro, S., Nagel, T., Nowak, W., Oladyshkin, S., Renz, A., Rienäcker-Burschil, J., Röhligh, K.-J., Sträter, O., Thiedau, J., Wagner, F., Wellmann, F., Wengler, M., Wolf, J., Rühaak, W.** (2024):
Uncertainties and robustness with regard to the safety of a repository for high-level radioactive waste: introduction of a research initiative
Environ. Earth Sci. **83**, art. 82 [10.1007/s12665-023-11346-8](https://doi.org/10.1007/s12665-023-11346-8)

13. **Lehmann, C., Bilke, L., Buchwald, J., Graebing, N., Grunwald, N., Heinze, J., Meisel, T., Lu, R., Naumov, D., Rink, K., Sen, Ö.O., Selzer, P., Shao, H., Wang, W., Zill, F., Nagel, T., Kolditz, O.** (2024):
OpenWorkFlow — Development of an open-source synthesis-platform for safety investigations in the site selection process
Grundwasser **29** (1), 31 - 47 [10.1007/s00767-024-00566-9](https://doi.org/10.1007/s00767-024-00566-9)
Main topic T8; Secondary topic T5

14. Liu, B., Wang, J., Li, H., Liu, J., Wang, P., Cai, W., Sun, X., **Chen, C.** (2024):
In-situ test and numerical investigation on the long-term performance of deep borehole heat exchanger coupled heat pump heating system
Case Stud. Therm. Eng. **61** , art. 104855 [10.1016/j.csite.2024.104855](https://doi.org/10.1016/j.csite.2024.104855)

15. Lüth, S., Steegborn, F., Heberling, F., Beilecke, T., Bosbach, D., Deissmann, G., Geckeis, H., Joseph, C., Liebscher, A., Metz, V., Rebscher, D., **Rink, K.**, Ryberg, T., Schennen, S. (2024):
Characterization of heterogeneities in the sandy facies of the Opalinus Clay (Mont Terri underground rock laboratory, Switzerland)
Geophys. J. Int. **236** (3), 1342 - 1359 [10.1093/gji/ggad494](https://doi.org/10.1093/gji/ggad494)

16. Mahanta, K.K., Pradhan, I.P., **Gupta, S.K.**, Shukla, D.P. (2024):
Assessing machine learning and statistical methods for rock glacier-based permafrost distribution in northern Kargil region
Permafrost Periglacial Process. **35** (3), 262 - 277 [10.1002/ppp.2240](https://doi.org/10.1002/ppp.2240)

17. Nguyen, T.S., **Kolditz, O.**, Yoon, J.S., Zhuang, L. (2024):
Modelling the thermo-mechanical behaviour of a rock joint
Geomech. Energy Environ. **37** , art. 100520 [10.1016/j.gete.2023.100520](https://doi.org/10.1016/j.gete.2023.100520)

18. Park, J.-W., Park, C.-H., Zhuang, L., Yoon, J.S., **Kolditz, O.**, McDermott, C.I., Park, E.-S., Lee, C. (2024):
Grain-based distinct element modeling of thermally induced slip of critically stressed rock fracture
Geomech. Energy Environ. **39** , art. 100580 [10.1016/j.gete.2024.100580](https://doi.org/10.1016/j.gete.2024.100580)

19. Pitz, M., Jacops, E., **Grunwald, N.**, Ziefle, G., **Nagel, T.** (2024):
On multi-component gas migration in single-phase systems
Rock Mech. Rock Eng. **57** (6), 4251 - 4264 [10.1007/s00603-024-03838-1](https://doi.org/10.1007/s00603-024-03838-1)

20. Radeisen, E., Shao, H., Hesser, J., **Naumov, D.**, **Wang, W.**, **Kolditz, O.** (2024):
Modelling of preferential gas flow in saturated bentonite using a bimodal, strain-dependent pore model
Appl. Clay Sci. **249** , art. 107232 [10.1016/j.clay.2023.107232](https://doi.org/10.1016/j.clay.2023.107232)
Main topic T8; Secondary topic T5

21. Radeisen, E., Shao, H., Pitz, M., Hesser, J., **Kolditz, O.**, **Wang, W.** (2024):
Combination of a failure index and a dilatancy-dependent permeability model in hydro-mechanically-coupled numerical simulations of argillaceous rock formations of the Callovo-Oxfordian (COx)
Rock Mech. Rock Eng. **57** (6), 4285 - 4298 [10.1007/s00603-024-03763-3](https://doi.org/10.1007/s00603-024-03763-3)

22. Richter, S., Lubashevsky, K., **Randow, J.**, Henker, S., **Buchwald, J.**, Bucher, A. (2024):
Global sensitivity analysis and uncertainty quantification for design parameters of
shallow geothermal systems
Geotherm. Energy **12** , art. 8 [10.1186/s40517-024-00287-5](https://doi.org/10.1186/s40517-024-00287-5)

23. **Schuetze, C.**, Koedel, U., **Herrmann, T.M.**, Liang, C., **Dietrich, P.** (2024):
Editorial: Citizen science and climate services in cities: current state, new approaches and
future avenues for enhancing urban climate resilience
Front. Earth Sci. **12** , art. 1461334 [10.3389/feart.2024.1461334](https://doi.org/10.3389/feart.2024.1461334)
Main topic T5; Secondary topic T8

24. **Selzer, P.**, **Shao, H.**, Behrens, C., **Lehmann, C.**, Seydewitz, R., **Lu, R.**, Kreye,
P., Rühaak, W., **Kolditz, O.** (2024):
The value of simplified models of radionuclide transport for the safety assessment of
nuclear waste repositories: A benchmark study
J. Contam. Hydrol. **267** , art. 104417 [10.1016/j.jconhyd.2024.104417](https://doi.org/10.1016/j.jconhyd.2024.104417)

25. Shao, H., Hesser, J., **Wang, W.**, **Kolditz, O.** (2024):
Modeling thermally driven migration of brine in bedded salt
Geomech. Energy Environ. **38** , art. 100542 [10.1016/j.gete.2024.100542](https://doi.org/10.1016/j.gete.2024.100542)

26. Shao, H., Radeisen, E., Hesser, J., **Wang, W.**, **Kolditz, O.** (2024):
Coupled processes at micro- and macroscopic levels for long-term performance
assessment studies of nuclear waste repositories
Minerals **14** (5), art. 453 [10.3390/min14050453](https://doi.org/10.3390/min14050453)

27. Taherdangkoo, R., Nagel, T., **Chen, C.-F.**, **Mollaali, M.**, Ghasabeh, M., Cuisinier, O.,
Abdallah, A., Butscher, C. (2024):
Modeling unsaturated hydraulic conductivity of compacted bentonite using a constrained
CatBoost with bootstrap analysis
Appl. Clay Sci. **260** , art. 107530 [10.1016/j.clay.2024.107530](https://doi.org/10.1016/j.clay.2024.107530)

28. Wang, Y., Shao, H., Kuhlman, K.L., Jove-Colon, C.F., **Kolditz, O.** (2024):
Shear-induced fluid localization, episodic fluid release and porosity wave in deformable
low-permeability rock salt
Geomech. Energy Environ. **40** , art. 100600 [10.1016/j.gete.2024.100600](https://doi.org/10.1016/j.gete.2024.100600)
Main topic T8; Secondary topic T5

29. Yi, H., Zhou, H., **Kolditz, O.**, Xue, D. (2024):
Insight into the elastoplastic behavior of Beishan granite influenced by temperature and
hydraulic pressure
Int. J. Rock Mech. Min. Sci. **177** , art. 105744 [10.1016/j.ijrmms.2024.105744](https://doi.org/10.1016/j.ijrmms.2024.105744)

30. **You, T.**, Zhu, Q., Li, W., Shao, J. (2024):
Phase-field modeling of thermal fracture and shear heating in rocks with degraded thermal conductivity across crack
Acta Mech. Solida Sin. **37** , 711 - 726 [10.1007/s10338-023-00452-6](https://doi.org/10.1007/s10338-023-00452-6)
Main topic T8; Secondary topic T5
31. Zhang, L., Zhou, H., Wang, X., Deng, T., **Chen, C.**, Zhang, H., Nagel, T. (2024):
Modeling the visco-elastoplastic behavior of deep coal based on conformable derivative
Mech. Time-Depend. Mater. **28** (2), 501 - 521 [10.1007/s11043-023-09588-x](https://doi.org/10.1007/s11043-023-09588-x)
32. Zheng, T., Yu, X., Gao, S., Chang, Q., Fang, Y., Zheng, X., **Kolditz, O.**, Luo, J. (2024):
Transient behavior of the freshwater-saltwater mixing zone after land reclamation in coastal aquifers
Adv. Water Resour. **189** , art. 104728 [10.1016/j.advwatres.2024.104728](https://doi.org/10.1016/j.advwatres.2024.104728)

Publications in other journals

33. **Nagel, T., Buchwald, J., Kiskurno, F.,** Pitz, M., Helfer, T. (2024):
Hierarchical modelling in benchmarking, analysis and code development for coupled
geo-processes
Proceedings in Applied Mathematics and Mechanics **24** (3),
e202400025 [10.1002/pamm.202400025](https://doi.org/10.1002/pamm.202400025)
34. **Zill, F.,** Silbermann, C., **Meisel, T.** (2024):
Far-field modelling of THM processes in rock salt formations
Open Geomechanics **5** , art. 3 [10.5802/ogeo.20](https://doi.org/10.5802/ogeo.20)

Edited books

35. Bucher, A., **Shao, H.**, Grimm, R., Schönfelder, S., Randow, J., **Vienken, T.**, **Rink, K.**, Zschoke, K. (Hrsg., 2024):
EASyQuart - Energieeffiziente Auslegung und Planung dezentraler Versorgungsnetze von Stadtquartieren. Heizen und Kühlen unter Nutzung oberflächennaher geologischer Ressourcen
Springer Spektrum, Berlin, Heidelberg, XVI, 299 S. [10.1007/978-3-662-67140-5](https://doi.org/10.1007/978-3-662-67140-5)
36. **Shao, H.**, Wang, J., Schäfer, T., Zhang, C.-L., Geckeis, H., **Nagel, T.**, Düsterloh, U., **Kolditz, O.**, Shao, H. (eds., 2024):
Thermo-hydro-mechanical-chemical (THMC) processes in bentonite barrier systems
Terrestrial Environmental Sciences
Springer Nature, Cham, XX, 149 pp. [10.1007/978-3-031-53204-7](https://doi.org/10.1007/978-3-031-53204-7)

Book chapters

37. Bucher, A., **Görke, U.-J.**, Grimm, R., **Hastreiter, N.**, **Kolditz, O.**, Lubashevsky, K., Randow, J., Richter, S., **Rink, K.**, Schönfelder, S., **Shao, H.**, **Vienken, T.**, Zschoke, H.K. (2024):
Einführung in das Verbundvorhaben Easyquart
In: Bucher, A., Shao, H., Grimm, R., Schönfelder, S., Randow, J., Vienken, T., Rink, K., Zschoke, K. (Hrsg.)
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Springer Spektrum, Berlin, Heidelberg, S. 1 - 43 [10.1007/978-3-662-67140-5_1](https://doi.org/10.1007/978-3-662-67140-5_1)
38. Henker, S., **Hastreiter, N.**, Randow, J., **Rink, K.**, Satke, P., **Vienken, T.**, Zschoke, H.K. (2024):
Standorte und Standortmodelle
In: Bucher, A., Shao, H., Grimm, R., Schönfelder, S., Randow, J., Vienken, T., Rink, K., Zschoke, K. (Hrsg.)
EASyQuart - Energieeffiziente Auslegung und Planung dezentraler Versorgungsnetze von Stadtquartieren. Heizen und Kühlen unter Nutzung oberflächennaher geologischer Ressourcen
Springer Spektrum, Berlin, Heidelberg, S. 45 - 52 [10.1007/978-3-662-67140-5_2](https://doi.org/10.1007/978-3-662-67140-5_2)
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39. **Moeller, L.**, **Knapp, S.**, Schmauck, S., Otto, P., **Schlosser, D.**, **Wick, L.Y.**, **Georgi, A.**, **Friesen, J.**, **Ueberham, M.**, **Trabitzsch, R.**, **Wollschläger, N.**, **Schlink, U.**, **Hofmann, D.**, **Müller, R.A.**, **Mackenzie, K.** (2024):
Gründächer im urbanen Raum und ihre Ökosystemleistungen
In: Kabisch, S., Rink, D., Banzhaf, E. (Hrsg.)
Die resiliente Stadt: Konzepte, Konflikte, Lösungen
Springer Spektrum, Berlin, Heidelberg, S. 165 - 180 [10.1007/978-3-662-66916-7_11](https://doi.org/10.1007/978-3-662-66916-7_11)
Main topic T5; Secondary topics T7, T8
40. Randow, J., Bucher, A., **Görke, U.-J.**, Grimm, R., **Hastreiter, N.**, **Kolditz, O.**, Lubashevsky, K., Richter, S., **Rink, K.**, Schönfelder, S., **Shao, H.**, **Vienken, T.**, Zschoke, H.K. (2024):
Fazit und Ausblick
In: Bucher, A., Shao, H., Grimm, R., Schönfelder, S., Randow, J., Vienken, T., Rink, K., Zschoke, K. (Hrsg.)
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Springer Spektrum, Berlin, Heidelberg, S. 275 - 283 [10.1007/978-3-662-67140-5_8](https://doi.org/10.1007/978-3-662-67140-5_8)
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41. Richter, S., Randow, J., **Shao, H.**, Lubashevsky, K., Henker, S., Bucher, A. (2024):
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In: Bucher, A., Shao, H., Grimm, R., Schönfelder, S., Randow, J., Vienken, T., Rink, K.,
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Springer Spektrum, Berlin, Heidelberg, S. 201 - 237 [10.1007/978-3-662-67140-5_6](https://doi.org/10.1007/978-3-662-67140-5_6)
42. **Rink, K.**, Grimm, R., **Hastreiter, N.**, Kroll, P., **Remmler, P.**, **Shao, H.**, Zschoke, H.K.
(2024):
Systemintegration
In: Bucher, A., Shao, H., Grimm, R., Schönfelder, S., Randow, J., Vienken, T., Rink, K.,
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Springer Spektrum, Berlin, Heidelberg, S. 239 - 273 [10.1007/978-3-662-67140-5_7](https://doi.org/10.1007/978-3-662-67140-5_7)
Main topic T8; Secondary topic T5

Conference papers

43. **Kiszkurno, F., Buchwald, J., Kolditz, O., Nagel, T.** (2024):
Hypothesis-testing and assisted-history-matching applied to evaluate uncertainty of model selection and parameter values: a case study of the impact of thermo-osmosis
EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024
EGUsphere
Copernicus Publications, EGU24-6012 [10.5194/egusphere-egu24-6012](https://doi.org/10.5194/egusphere-egu24-6012)
44. **Shao, H., Selzer, P., Behrens, C., Lehmann, C., Kreye, P., Rühaak, W., Kolditz, O.** (2024):
Validation and benchmarking of simplified reactive transport models of radionuclides for the assessment of nuclear waste repositories
EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024
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Copernicus Publications, EGU24-6036 [10.5194/egusphere-egu24-6036](https://doi.org/10.5194/egusphere-egu24-6036)

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