Recently an algebraic approach to topological quantum field theories has been attentively studied by use of the so-called generalized symmetries. Applications of the generalized symmetries to theories of gravity are also investigated, see, *e.g.*, [1, 2]. In this article the authors elaborate these lines of developments, focusing on linearized gravity. For basics on linearized gravity discussed in this article, see [3, 4]. Utilizing structural analogy between electromagnetic theory and linearized gravity, the authors study the so-called shift symmetries of the graviton. As discussed in this article, use of the shift symmetries and resultant algebraic properties enables us to treat generalized symmetries and gauging of them in a transparent way. Interested readers should also refer to a related paper [5] on gauging of the generalized symmetries in linearized gravity.

References

[1] V. Benedetti, H. Casini and J. M. Magan, JHEP **05**, 045 (2022) doi:10.1007/JHEP05(2022)045 [arXiv:2111.12089 [hep-th]].

[2] K. Hinterbichler, D. M. Hofman, A. Joyce and G. Mathys, JHEP **02**, 151 (2023) doi:10.1007/JHEP02(2023)151 [arXiv:2205.12272 [hep-th]].

[3] C. Hull, M. L. Hutt and U. Lindström, JHEP **07**, 097 (2024) doi:10.1007/JHEP07(2024)097 [arXiv:2401.17361 [hep-th]].

[4] C. Hull, M. L. Hutt and U. Lindström, Class. Quant. Grav. **41**, no.19, 195012 (2024) doi:10.1088/1361-6382/ad718a [arXiv:2405.08876 [hep-th]].

[5] C. Hull, M. L. Hutt and U. Lindström, JHEP **01**, 145 (2025) doi:10.1007/JHEP01(2025)145 [arXiv:2410.08720 [hep-th]].