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Signatures of asymptotic symmetries in gravitational memory SHAILESH KUMAR, SRIJIT BHATTACHARJEE, Indian Institute of Information Technology, Allahabad, ARPAN BHATTACHARYYA, Indian Institute of Technology, Gandhinagar — The direct detection of the gravitational wave has enabled researchers to look for various aspects of black hole spacetimes; gravitational-wave memory (GW memory) is one of such effects which has not been detected yet. The memory effect manifests a permanent displacement in the spacetime, i.e., a relative change in the position of freely falling LIGO test masses. It has been shown that memory is related to the asymptotic symmetries of spacetimes originally discovered by Bondi-van der Berg-Metzner Sachs (BMS). From a theoretical perspective, recovering asymptotic symmetries near the horizon of black holes has become a matter of interest to the researchers as Hawking, Perry and Strominger conjectured that the charges corresponding to such symmetries would help to retrieve information in the information loss puzzle. Therefore, the memory effect must be well-studied in the context of asymptotic symmetries from theoretical as well as experimental standpoints. In this direction, I would focus on investigating some of these aspects by estimating measurable effects on the detectors after the passage of GWs. My aim would be to provide some theoretical features of the displacement memory effect near the horizon of black holes and its possible connection with near-horizon BMS symmetries.

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