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Shadows near supermassive black holes: from a theoretical concept to GR test

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Due to an expected progress of observational facilities Zakharov et al. (2005a) proposed to use global and ground – space VLBI observations in mm band to detect a shadow at Sgr A* as a tool to evaluate a black hole spin and a position angle of distant observer. In particular, it was predicted that the shadow diameter is around $52 \mu\text{as}$ for the Sgr A* case and this prediction was remarkably confirmed by the Event Horizon Telescope (EHT) Collaboration on 12 May 2022. Also Zakharov et al. (2005b) showed that a black hole charge can be evaluated from shadow size estimates. Zakharov (2014) generalized these relations for the tidal charge case. In 2019 the EHT Collaboration reconstructed shadows at M87* in 2019 and at Sgr A* in 2022. As it was shown by Zakharov (2022) a black hole charge can be found analytically from these observations.

References

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