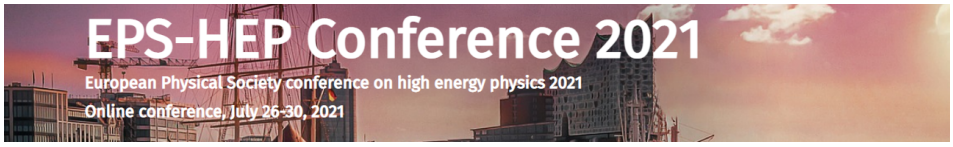

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Quantum black holes and ringdown physics with LIGO-Virgo detections

Wednesday 28 July 2021 10:10 (20 minutes)

The gravitational-wave ringdown from black holes gives us direct access to the nature of space-time around them. Thus ringdown signals have the potential to shed some light on the quantum nature of black hole space-times. We present an observational investigation of the hypothesis that the black hole area is quantised in multiples of the Planck area. This hypothesis relies on a recently-proposed heuristic ringdown model built from the Bekenstein-Mukhanov area quantisation conjecture. We test this scenario by combining all the available information from the black hole population included in the GWTC-2 catalog. A time-domain analysis, based on the pyRing software used by the LVK Collaboration, is employed to quantify the evidence for the presence of signatures of the area quantisation in ringdown signals. We also discuss future prospects of effects due to the area quantisation with detections from ground-based detectors at their design sensitivity.

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Collaboration / Activity

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