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Operational islands in JT gravity

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In this work, we revisit the problem of finding entanglement islands in 2d Jackiw-Teitelboim (JT) gravity. We implement the following adjustments to the traditional setup: (1) we do not explicitly couple to a non-gravitating system, instead we implement only pure absorption into a fiducial detector, (2) we utilize the operationally defined renormalized matter entanglement entropy, as defined by the boundary observer's worldline. By 'operational' we mean in the sense that the observer has access to 'clocks and rods' to locate the position of the island. We show that this leads to a unitary Page curve that we explicitly compute, with an island outside of the event horizon. For a macroscopic black hole, this curve nicely follows Hawking's calculation first and then decreases with the Hawking-Bekenstein entropy.

In-person or Virtual?

Virtual

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