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## Operational islands and black hole dissipation in JT gravity

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 nongravitating system, instead we implement only pure absorption into a fiducial detector, (2) we utilise the operationally defined renormalised matter entanglement entropy, as defined by the boundary observer's wordline. We show that this leads to a unitary Page curve that we explicitly compute, with an island outside of the event horizon. Next, we extend the analysis to a charged and/or supersymmetric black hole. We find that in a certain regime the charged black hole grows first as it emits superradiation before eventually dissipating. We obtain similar results when embedding the system in a supersymmetric setting.

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