Corbordisms and commutators: Handles and Junctions

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Abstract

The Swampland Cobordism Conjecture predicts the existence of configurations dynamically connecting different consistent theories of quantum gravity and/or nothing. Usually, the existence of conserved topological charges requires the introduction of associated UV defects that kill the appropriate cobordism class. However, in some cases, such as theories with non-trivial gauge bundles of a symmetry group G, dynamical changes in the topology of spacetime break the set of conserved topological charges to a smaller group. For the first two bordism groups of theories admiting a G-bundle, we see how some properties of G, namely its commutator width and second homology group, predict non-trivial properties for the set of bordism defects. We illustrate this with the Heisenberg group describing the monodromy transformations of axionic fields in 4d theories. Based on 2605.15276 and 2605.18952

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