



Contribution ID: 18

Type: not specified

## Dimensional reduction along the RG flow in combinatorially non-local field theories

*Monday, 25 July 2022 16:35 (20 minutes)*

Combinatorially non-local interactions are at the heart of matrix and tensor theories as well as non-commutative field theory. Interestingly, for theories on a compact domain their renormalization group equations are non-autonomous in the momentum scale. We show that this should be regarded not as an issue but as a feature of such theories leading to a reduction of the effective dimension of the field theory along the renormalization group flow. We illustrate this with the example of a field theory with tensorial symmetry using the functional renormalization group in the cyclic-melonic potential approximation. While this yields a dimensional flow on compact domain, we also find a new phase structure with hints for an asymptotic safe fixed point in the large-volume limit.

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