



Contribution ID: 9

Type: not specified

## The long-range XY model and other examples of exotic BKT scaling

*Monday, 25 July 2022 15:20 (25 minutes)*

The two dimensional classical  $XY$  model is characterised by the presence, in the short-range regime, of a line of RG fixed points, which gives rise to the celebrated Berezinskii - Kosterlitz - Thouless (BKT) phenomenology. We will discuss the deformation of the BKT scaling caused by the inclusion of power-law decaying couplings, yielding a coexistence of spontaneously symmetry broken (SSB) and BKT phases in the phase diagram. Perturbative RG arguments imply that the SSB phenomenology observed in this model is described by a novel form of universality. Finally, in the last part of the talk, we are gonna extend our description of BKT scaling outside of the equilibrium world and consider the BKT scaling generated by the inclusion of non-Hermitian terms in the model Hamiltonian.

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