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# Abelian-Higgs dualities in quantum defect-mediated melting phase transitions

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## 概　要

In the study of zero-temperature quantum phase transitions, instead of looking how symmetry is broken, it is often useful to see how symmetry can be restored by the condensation of topological defects. Through a duality mapping, Nambu-Goldstone modes are represented by gauge bosons, mediating long-range interactions between topological defects. When the latter condense, those bosons get a mass via the Anderson-Higgs mechanism, which signals the loss of rigidity and the restoration of symmetry.

I will first review the best-studied case: the 2+1D superfluid-insulator transitions where the defects are U(1) vortices. Consecutively several extensions are discussed: going to 3+1D where the defects are not point particles but strings, and quantum elasticity, which studies breaking of spatial translations and rotations.

References:

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