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Roberge-Weiss periodicity and confinement-deconfinement transition

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We propose a new determination of the confinement-deconfinement transition by using the imaginary chemical potential. The imaginary chemical potential can be interpreted as the Aharonov-Bohm phase and then an analogy of the topological-order suggests that the Roberge-Weiss endpoint would define the deconfinement temperature. Based on the topological property, we can construct a new quantity which describes the confinement-deconfinement transition. This quantity is defined as the integral of the quark number susceptibility along the closed loop of θ where θ is the dimensionless imaginary chemical potential. Expected behavior of it at finite temperature is discussed and its asymptotic behaviors are shown.

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