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## Reconstruction and interpretation of propagators with complex singularities

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Several theoretical models and recent numerical studies propose the existence of complex singularities in propagators of confined particles, specifically the Landau-gauge gluon propagator. Such singularities are beyond the conventional framework of quantum field theory, necessitating a detailed analysis of the reconstruction from Euclidean to Minkowski propagators. This talk will present our rigorous studies on this reconstruction when complex singularities exist. We show that the analytically continued Wightman function is holomorphic in the standard tube, and the Lorentz symmetry and locality are maintained. On the other hand, the reconstructed Wightman function violates the temperedness and positivity condition. Lastly, we discuss possible quantum mechanical interpretations and their implications on confinement mechanism.

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