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Scalar and TT mode spectral functions of Lorentzian quantum gravity

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We compute the asymptotically safe graviton propagators of the transverse-traceless and scalar mode within Lorentzian quantum gravity. To that end, we determine the interacting UV fixed point in Lorentzian signature, find connecting UV-IR trajectories, and solve the coupled system of running Kallen-Lehmann spectral representations. The resulting spectral functions are compatible with causality and unitarity. Furthermore, they provide direct access to the full quantum propagators, the corresponding Weyl-tensor and Ricci-scalar form factors in the quantum effective action, and UV scaling dimensions.

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