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Geometric Design and Stability of Power Networks

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From the perspective of the network theory, the present work illustrates how the parametric intrinsic geometric description exhibits an exact set of pair correction functions and global correlation volume with and without the inclusion of the imaginary power flow. The Gaussian fluctuations about the equilibrium basis accomplish a well-defined, non-degenerate, curved regular intrinsic Riemannian surfaces for the purely real and the purely imaginary power flows and their linear combinations. An explicit computation demonstrates that the underlying real and imaginary power correlations involve ordinary summations of the power factors, with and without their joint effects. Novel aspect of the intrinsic geometry constitutes a stable design for the power systems.

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