

Abstract Submitted
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Semiclassical propagation of correlation functions in closed electromagnetic environments¹ GABRIELE GRADONI, STEPHEN CREAGH, GREGOR TANNER, University of Nottingham, United Kingdom — Field-field correlation functions can be propagated efficiently within confined systems through the Wigner-Weyl formalism. A semiclassical Frobenius-Perron operator is derived for the propagation of Wigner functions as a solution of the associated boundary integral equation. This idea is used to study the effect of non-integrable (chaotic) dynamics on the propagation of classical noisy fields. Model systems for quantum mechanics are used to mimic the radiation into closed spaces. A realistic model of statistical sources into a semi-open polygonal billiard is also presented. We find that the simplest description in terms of the classical Frobenius-Perron operator provides a description of the frequency-averaged correlation function but that wave-resonant and interference effects can also be accounted for. Applications of the theory focus on the prediction of energy distribution through electromagnetic environments in electromagnetic compatibility, wireless communication systems, and imaging optics.

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