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Calculating the Photon Polarization Tensor Without Renormalizing KENNETH BRAND, United Technologies — In this presentation, the Quantum Electrodynamics photon polarization tensor is evaluated in momentum space using new techniques. The resulting polarization tensor is automatically gauge invariant. No divergent quantities are encountered; there is no need to renormalize. Our tensor agrees with the standard renormalized QED tensor. The key innovations in these calculations are: 1)Reducing the number of integration variables at a stage farther into the calculations than is usual, 2) Separating the scalar propagator into real and imaginary parts, and 3)Regularizing some integrals by employing weighting functions that are the fourier transforms of support based delta functions.

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