

INVESTIGATION OF THE DUFFIN-KEMMER  
PROPAGATOR IN SCALAR ELECTRODYNAMICS

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We investigate the first order approximation of the Schwinger-Dyson equation for the scalar particle propagator in the Duffin-Kemmer formalism of scalar electrodynamics. This propagator can be presented as a sum of five linearly independent quantities in the space of  $5 \times 5$   $\beta$ -matrices. A system of 5 non-linear integral equations is obtained for an arbitrary number of the space-time dimensions. A special attention is paid to the case of  $d=2$  dimensions because of its renormalizability. By appropriately chosen gauge parameter, we can simplify the system of 5 equations reducing them to the smaller system of integral equations. We also discuss the problem of finiteness of this propagator.