On the importance of Homeomorphic Operations in Physical and Geometrical Optics

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Abstract

Physical-optics system modeling can be performed by connecting different rigorous and approximated field solvers, which are selected to efficiently solve Maxwell’s equations in the individual mathematical regions into which a system can be torn. We discuss the case in which a sequence of connected solvers constitutes a 1:1 mapping between the input and the output fields. It turns out that such sequences are (1) the key to fast physical optics and (2) they reveal how ray tracing is embedded in and accessible through physical optics.