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Quantum metamaterials as a tool for investigating the quantum-classical transition SERGEY SAVELIEV, ALEXANDRE ZAGOSKIN, MARK EVERITT, RICHARD WILSON, Department of Physics, Loughborough University, Loughborough LE11 3TU, UK — Quantum metamaterials are optical media comprised of individually controllable unit elements (e.g., qubits), which maintain quantum coherence for periods sufficient for an electromagnetic wave to pass through the system. They represent macroscopic, spatially extended quantum scatterers, which can be put in a superposition of states with different properties (e.g., different refractive indexes) and can thus provide new ways of testing different scenarios of quantum-classical transition. We consider an inverse of the classic double-slit experiment, where a classical electromagnetic wave is scattered by a quantum metamaterial in a superposition of states, and discuss the possibilities of its experimental realization.

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