

Berry Phase and HBT Experiment

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Entanglement, coupling the wavefunctions nonlocally, is the key element of many quantum research topics such as EPR paradox, Bell's inequality, teleportation, quantum communication, and quantum computing. Berry's geometric phase, acquired by a system after following a closed circuit in the parameter space, plays the major role in many different quantum interference phenomena. We demonstrate that two-photon coincident detection or HBT interferometer can measure the Berry phase acquired by the featureless signal light beam, generated by spontaneous parametric down conversion and entangled with its idler counterpart.