Physica Scripta. Vol. 64, 220-225, 2001

# Which-Path Information and Coherence of Elastic Scattering

Joach im Jacoby*

Gesellschaft für Schwerionenforschung, Planckstraße 1, 6 4291 Darmstadt, Germany

*Received January 4, 2001; revised version received March 15, 2001; accepted March 25, 2001*

PACS Ref: 34.50.- s, 34.80.Pa, 03.65.Bz, 03.75.-b

## Abstract

Scattering experiments with electron pairs are discussed, where the electrons differ from each other only by their spin directions. By measuring the final polarization stage of the electrons at different spin orientations, a strong correlation between these spin states is expected to keep the electrons distinguishable. In turn, the verified spin correlation between two electrons is regarded as clear experimental evidence for coherence. The necessary which-path information to destroy coherence is estimated as the time-of-flight difference between two fermions.