

Time-resolved single electron interference in semiconductor quantum circuits

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Two quantum dots are embedded in a ring geometry. A close by quantum point contact serves as a charge detector for charge localized in one of the dots. If the quantum point contact is driven at high bias photons are emitted and individually detected by the properly tuned double dot systems. Similar experiments are possible by using InAs nanowire quantum dots with a suitable charge read-out in an underlying 2DEG. In a second experiment we probe the coherence of individual electrons as they pass through the ring geometry and get localized for some time in one of the dots and therefore detected by the quantum point contact.