

**Modeling and theoretical analysis of devices applied to quantum computing and quantum information technology. Analysis of quantum entanglement, qubit manipulation in realistic physical systems and studies of decoherence of quantum states coupled to the environment.**

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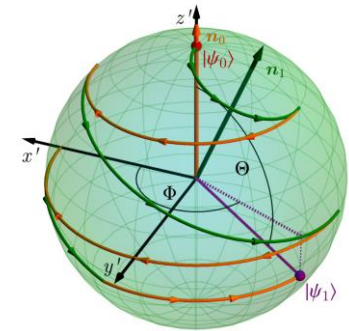
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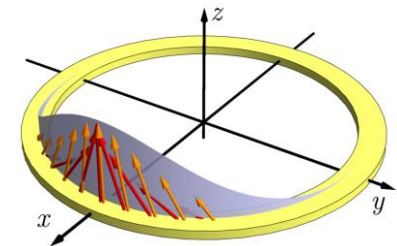
### overview over last ten years

- [Arbitrary qubit transformations on tuneable Rashba rings](#), Phys. Rev. B **93**, 075432 (2016).
- [Exact nonadiabatic holonomic transformations of spin-orbit qubits](#), Phys. Rev. Lett. **112**, 150402 (2014).
- [A non-adiabatically driven electron in a quantum wire with spin-orbit interaction](#), New J. Phys. **15**, 013029 (2013); [Video abstract](#).
- [Geometric analysis of entangled qubit pairs](#), New J. Phys. **13**, 103037 (2011).
- [Entanglement of static and flying qubits in degenerate mesoscopic systems](#), Phys. Rev. B **77**, 075337 (2008).
- [Entanglement of two delocalized electrons](#), Phys. Rev. A **74**, 010304(R) (2006).

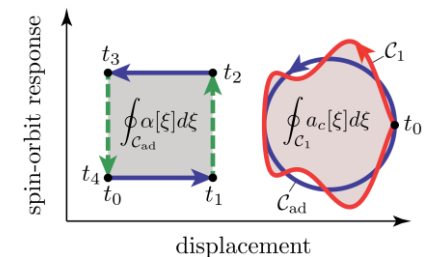
### latest results



Demonstration of arbitrary qubit transformations on the Bloch sphere (PRB 2016).



Quantum ring enabling controlled qubit manipulation (PRB2016).



Exact non-adiabatic qubit manipulation (PRL 2014).

## Modeliranje in teoretična analiza elementov naprav v zvezi s kvantnim računalništvom in tehnologijo kvantne izmenjave informacij. Analiza kvantne prepletenosti in manipulacije kvantnih bitov v realističnih fizikalnih sistemih ter študij dekoherence kvantnih stanj zaradi vpliva okolja.

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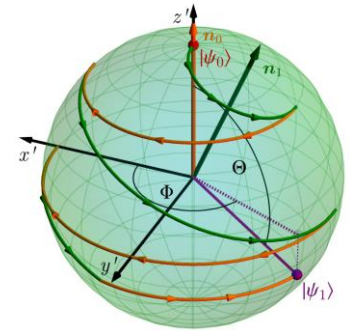
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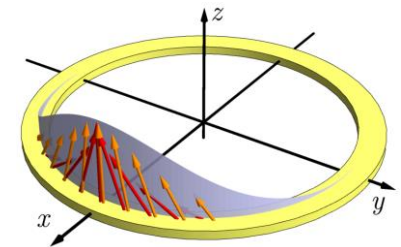
### pregled dela zadnjih desetih let

- [Arbitrary qubit transformations on tuneable Rashba rings](#), Phys. Rev. B **93**, 075432 (2016).
- [Exact nonadiabatic holonomic transformations of spin-orbit qubits](#), Phys. Rev. Lett. **112**, 150402 (2014).
- [A non-adiabatically driven electron in a quantum wire with spin-orbit interaction](#), New J. Phys. **15**, 013029 (2013); [Video abstract](#).
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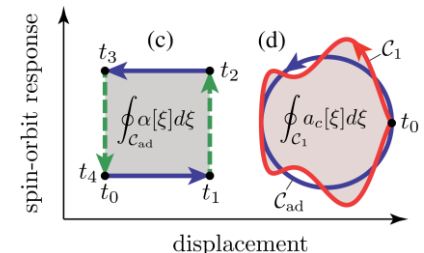
### najnovejši rezultati



Demonstracija poljubne transformacije kvantnih bitov na Blochovi sferi (PRB 2016).



Kvantni obroč, ki omogoča kontrolirano manipulacijo kvantnih bitov (PRB2016).



Eksaktna in neadiabatična manipulacija kvantnih bitov (PRL 2014).