

Abstract Submitted  
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**Spin Manipulation through geometric phase in III-V semiconductor quantum dots**<sup>1</sup> SANJAY PRBAHAKAR, RODERICK MELNIK, Wilfrid Laurier University — A more robust technique is proposed to flip the spin completely through geometric phase in III-V semiconductor quantum dots (QDs). We transport the QDs adiabatically in a closed loop along the circular trajectory in the plane of two dimensional electron gas with the application of time dependent gate controlled electric fields and investigate the manipulation of Berry phase with the spin-orbit couplings. Here we show that both the Rashba and the Dresselhaus couplings are present for inducing a phase necessary for spin flip. If one of them is absent, the induced phase is trivial and irrelevant for spin-flip (Phys. Rev. B **89**, 245310 (2014), Applied Physics Letters 104, 142411 (2014)).

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