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Non-adiabatic processes below the gap energy in p-wave superfluids[1] GUNNAR MÖLLER, NIGEL R. COOPER, University of Cambridge, VICTOR GURARIE, University of Colorado at Boulder — We argue that non-adiabatic transitions to subgap states on vortices in p-wave superfluids can significantly complicate the use of their non-abelian statistics for quantum information processing. To avoid these difficulties, we suggest to work in the regime of a small number of subgap states, which can be achieved in atomic superfluids. In this regime, the semiclassical approximation to the Bogoluibov-deGennes equations by Kopnin and Salomaa is not applicable. Based on numerical calculations in the spherical geometry, we calculate the system parameters for which the energy gap to the subgap states is maximized for p-wave superfluids obtained either by Feshbach resonances or by using microwave induced precessing dipole interactions of dipolar molecules.

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Gunnar Möller
University of Cambridge

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