

# Cooper pair pumping in superconducting networks

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I will discuss how geometric phases emerge in superconducting nanocircuits and show their relation with Cooper pair pumping. I will present a proposal where non-abelian effects can be detected in the pumped charge [1]. Furthermore I will also discuss how to apply optimal control theory to realize Cooper pair pumps where the transferred charge is quantized in units of the Cooper pair charge [2].

[1] V. Brocco, R. Fazio, F. W. J. Hekking, and A. Joye, arXiv :cond-mat/0702333

[2] S. Safaei, S. Montangero, F. Taddei and R. Fazio, in preparation