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Giant oscillations of energy levels in mesoscopic superconductors¹ VALERII VINOKUR, Argonne National Laboratory, NIKOLAY KOPNIN, Low Temperature Laboratory, Helsinki, ALEXANDER MELNIKOV, VALENTINA POZDNYAKOVA, DENIS RYZHOV, IGOR SHERESHEVSKII, Institute for Physics of Microstructures, Nizhny Novgorod, GSP-105, Russia — The interplay of geometrical and Andreev quantization in mesoscopic superconductors leads to giant mesoscopic oscillations of energy levels as functions of the Fermi momentum and/or sample size. Quantization rules are formulated for closed quasiparticle trajectories in the presence of normal scattering at the sample boundaries. Two generic examples of mesoscopic systems are studied: (i) one dimensional Andreev states in a quantum box, (ii) a single vortex in a mesoscopic cylinder.

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