Erratum for

Theory for Quantum Dot Charge Qubits - Decoherence due to Cotunneling

by

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Erratum

My original work [1] contains errors. The following errors have been identified and are corrected or at least commented.

Chapter 1

None.

Chapter 2

On page 6: in earlier versions of the thesis ϵ_{as} was defined as $\epsilon_{\text{as}} = \epsilon_l - \epsilon_r$, the correct definition is $\epsilon_{\text{as}} = (\epsilon_l - \epsilon_r)/2$.

Chapter 3

None.

Chapter 4

On page 17: c is defined is a specific way; an alternative and easier definition would be $c = \frac{\hbar \Gamma^2}{16\pi}$. This is due to another formulation of the coupling to the leads in the form of the parameter Γ, which in turn is defined by $\hbar \Gamma = 2\pi t_c^2 \nu$, where $\nu = \sqrt{c_1}$ is the density of states in the leads.

On page 19: in earlier versions of this thesis, there has been an unintended exchange of $\sin^2 \theta$ and $\cos^2 \theta$ in equations (4.44) and (4.45). In the expression for Γ_r, there must be the $\sin^2 \theta$. And in equation (4.45), the $\cos^2 \theta$ must appear.

Chapter 5

On pages 23 and 24: in equations (5.8) - (5.11), the expressions for the current or the current matrix should not be time-dependent. This can be seen in the formulae (5.6) and (5.7) above, where no explicit time-dependence occured for these quantities.

Chapter 6

For the whole chapter: Due to a typo in the implementation of the calculation, all pictures are lacking a factor of ca. 10. In one pre-factor $\frac{\pi}{32}$ was used instead of the correct $\frac{1}{32\pi}$.
On page 34: The comments on Figure 6.9 are not exactly right. Especially the limit for the atomic limit was not correct. It should read $\gamma < \epsilon_{as}$.
On page 36: Therefore, Figure 6.11 has some wrong limits in it and the discussion can be done in a better way [2], as we found out later. One also should use "inelastic cotunneling" instead of "two-channel regime" and "elastic cotunneling" instead of "one-channel regime".
On page 44 (and the following pages): A very naive understanding of the stability of the system is presented in section 6.7. A more sophisticated analysis reveals a consequently better explainable and nice explanation, which has been treated in [3].

Chapter 7

None.

Chapter 8

None.

Appendix A

None.

Appendix B

On page 60: the new constant, according to the new definition of c for chapter 4, c_3 is given by $c_3 = \frac{\hbar\Gamma}{4\pi}$.

Appendix C

For the definition of c, see comment for chapter 2.

Appendix D

None.

Appendix E

None.

Appendix F

None.

Used symbols

On page 73: see comment for chapter 2.

Bibliography

[1] U. Hartmann, master's thesis / Diplomarbeit, University of Bonn (2002).

[2] U. Hartmann and F.K. Wilhelm, Phys. Rev. B **67** 161307(R) (2003) or cond-mat/0212063.

[3] U. Hartmann and F.K. Wilhelm, cond-mat/0302572 (2003), submitted to Phys. Rev. Lett.