Erratum: Memory effect in a molecular quantum dot with strong electron-vibron interaction [Phys. Rev. B 67, 235312 (2003)]

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There are typos in Eqs. (45) and (46) in the above-named paper (Ref. 1). These equations have illustrated the absence of current switching (current bistability) in a molecular quantum dot (MQD) with a double-degenerate level, $d=2$. The typos are corrected below, but they do not change the result. Indeed, current bistability does not exist in the present model of electron coupled to vibronic excitations for degeneracy $d\leqslant 2$, and we showed earlier that it also does not exist in a negative-U model for the same degeneracy of the MQD (Ref. 2).

The rate equation (45) should read

$$n^2(a_0 - a_1 - b_0 + b_1) + n(2 - a_0 + 2b_0 - b_1) - b_0 = 0, \tag{1}$$

and Eq. (46) for the two solutions for the electron occupation number n should read

$$n_{1,2} = -\frac{2 - a_0 + 2b_0 - b_1}{2(a_0 - a_1 - b_0 + b_1)} \pm \left[\frac{(2 - a_0 + 2b_0 - b_1)^2}{4(a_0 - a_1 - b_0 + b_1)^2} + \frac{b_0}{a_0 - a_1 - b_0 + b_1}\right]^{1/2}. \tag{2}$$

It is straightforward to prove that the first term in Eq. (2) is *negative* at all parameters of the system. Indeed, we have shown that $0<b_r<a_r<1$ for any temperature and bias voltage.[1] Therefore, the numerator in the first term is positive, $2-a_0+2b_0-b_1>0$, and it is immediately clear from the definition of a_r and b_r, Eqs. (38) and (39) in Ref. 1, respectively, that $a_0-b_0>a_1-b_1$, so that the denominator in the same term is also positive. Therefore, we see that the occupation number n has only one physical root, $n>0$, for $d=2$.

We reaffirm our result that the current switching in the present model of MQD exists only for degeneracy $d>2$.

[1] A. S. Alexandrov and A. M. Bratkovsky, Phys. Rev. B **67**, 235312 (2003).
[2] A. S. Alexandrov, A. M. Bratkovsky, and R. S. Williams, Phys. Rev. B **67**, 075301 (2003).

