Comments on ‘The influence of the 1st AlN and the 2nd GaN layers on properties of AlGa_{0.3}N/2nd AlN/2nd GaN/1st AlN/1st GaN structure’

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Received: 3 August 2013 / Accepted: 14 August 2013 / Published online: 21 August 2013
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The influence of the 1st AlN interlayer and the 2nd GaN interlayer on properties of the Al_{0.3}Ga_{0.7}N/2nd AlN/2nd GaN/1st AlN/1st GaN HEMT structure was theoretically investigated by self-consistently solving coupled Schrödinger and Poisson equations for the first time [1]. Some creative work has been done well in that paper. However, there are a few viewpoints that need to be discussed deeply.

1. The Fermi level should be shown in Figs. 2 and 6 so as to visually explain the decrease of the 2DEG in the potential well.
2. According to physical laws, the 2DEG always tends to be steady and stay in the lower energy level. However, the 2nd potential well in Figs. 2 and 6 is always higher than the 1st one. And, it seems that the 2DEG should not stay in the 2nd potential well. Nevertheless, the 2DEG

appears in the 2nd one in some cases. This phenomenon should be explained more deeply.

3. How does the 2DEG transfer from one potential well to another? In other words, under what conditions does the 2DEG transfer happen? This should be discussed further.

Acknowledgements This work was financially supported by the Fundamental Research Funds for the Central Universities (Grant No. 2652013067).

References

1. Y. Bi, X.L. Wang, C.B. Yang, H.L. Xiao, C.M. Wang, E.C. Peng, D.F. Lin, C. Feng, L.J. Jiang, Appl. Phys. A **104**, 1211 (2011)

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