



SDI Review Form 1.6

Journal Name:	Physical Science International Journal
Manuscript Number:	2014_PSIJ_14438
Title of the Manuscript:	New metrology approach for single molecular device: probing of molecular energy gap by electrical and optical measurements
Type of the Article	

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)



SDI Review Form 1.6

PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments		
Minor REVISION comments	1. There are some typos and grammatical errors . 2. In first page line 32, "This development molecular orbital" this sentence is not properly framed please rewrite it. 3. The tabulated data are not compared with any of the previous results throughout the text. 4. The author should compare the authenticity of the result with the previous theoretical/experimental results or with the results of similar model.	Thank you a lot for your comments. 1. We fixed errors and typos. 2. This sentence was changed to "This crossover methodology has potential to become a metrology tool for analysis of molecular nanojunctions due to the correlation between energy scale of transition point (Vtrans) and optical offset between Fermi Energy Level (EF) and nearest molecular orbital (MO)." We added a sentence after the Table 1. "Values of Φ_B, α and G0 parameters are similar to the corresponding values obtained in other studies of tunnelling through single molecules [3,4,5,13,33]." We added a new last paragraph in the text to address your comment.: There has been a range of experimental and theoretical studies demonstrating that electric and optical measurements in molecular self-assembled nanostructures [1, 46] can be compared in the same energy scale. Examples of these studies include inelastic spectroscopy [6], Kelvin probe measurements [17,18], optical illumination of molecular nano-structures [1] and theoretical studies of molecular energy gap [47]. Methods and approaches developed in



SDI Review Form 1.6

		these studies can be used to confirm presence of a specific molecule in the molecular nano-junction. Similarly to these methods, the energy gap proximity approach, $\Phi B \Sigma \approx \Delta o$, described in the present article, is based on comparing optical and electrical measurements of single molecular devices in the same energy scale. Similarly to the previous studies [1,6,17,18], the energy gap proximity approach also provides information on the molecular structure of nanodevices. However, despite all similarities, our contribution to the research in the area of molecular nanoelectronics is in the fact that we have experimentally demonstrated, for the first time, energy proximity of electrical and optical gaps in single molecular structures. In addition, we have developed a new metrology approach for molecular nanoelectronics that is based on the proximity of electrical and optical gaps.
<u>Optional/General</u> comments	If there are any ethical issues please clarify	There are no ethical and conflict of interest issues in this study.