SCIENCEDOMAIN *international*
www.sciencedomain.org

SDI FINAL EVALUATION FORM 1.1

PART 1:

Journal Name:	Physical Science International Journal
Manuscript Number:	**2015_PSIJ_17567**
Title of the Manuscript:	**Modeling and Simulation of High Blocking Voltage in 4H Silicon Carbide Bipolar Junction Transistors**
Type of Article	

PART 2:

FINAL EVALUATOR'S comments on revised paper (if any)	**Authors' response to final evaluator's comments**
There is a thesis on that topic, "Simulation and Characterization of Silicon Carbide Power Bipolar Junction Transistors" BENEDETTO BUONO Doctoral Thesis Stockholm, Sweden, Is he same person with the author? Please confirm ethical issue that author obey ethical rules! What is the difference of his study from this thesis?	There is a major misunderstanding in underlying physics and design of the transistors presented in these two works. 1. The doctorate thesis published in 2012 is mainly on Junction Termination (JTE) SiC bipolar transistor. That device has an uncovered piece of semiconductor that extend beyond base region which terminates electric field at much higher values resulting in very high breakdown voltage. Our device is not JTE! 2. Our project presents simulation work on a device developed by Luo, reference no. [34] of the manuscript. Again our device in not JTE design. The base metal contact is at far left of the base region and the breakdown mechanism is due to punch-through effect which is the main discussion of our manuscript. 3. Under my supervision Xinyue Niu (my graduate student at University of Colorado from 2008-2010) has completed his Master Thesis in 2010 which this manuscript is based on! Please see reference no. 33 of the manuscript: Niu, X., 2010. Design and Simulation of 4H Silicon Carbide Power Bipolar Junction Transistors, MSEE thesis, University of Colorado, Denver. Also see: Niu, X. and Fardi, H. Effects of base doping and carrier lifetime on differential current gain and temperature coefficient of 4H-SiC bipolar junction transistors, International Journal of Electronics, 99(4), pp. 531-542, 2011. These works are published prior to the Thesis pointed by the reviewer. 4. Anytime that one does simulation work, needs to use certain theoretical and physical equations that correctly predict the behavior or a phenomena in a device, in this case it would be breakdown voltage and specific-on resistance calculations. The presentation of these equations in form of charts and graphs help readers to understand the overall scope of the work. These equations can be found in many articles and technical papers and are used as a guideline for

	many theoretical works. 5. In study of transistors in general we normally look at certain characteristics: Transistor's gain is one important factor to look at or specific-on resistance is another. All transistors also have almost similar current-voltage characteristics (they look the same!). These similarities are due to the exponential behavior of a junction diode (transistor has two diodes) together with a constant current source. These similarities must not confuse one with as being the same results or the same data!