



SDI Review Form 1.6

PART 1:

Journal Name:	British Journal of Applied Science & Technology
Manuscript Number:	2013_BJAST_3653
Title of the Manuscript:	Defective Barrier on Voltage Optimization for Small Airgap

General guideline for Peer Review process is available in this link:

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

- This form has total 7 parts. Kindly note that you should use all the parts of this review form.



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PART 2: Review Comments

	Reviewer's comment	Author's comment <i>(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)</i>
<u>Compulsory</u> REVISION comments	none	



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Minor REVISION comments	The paper could significantly be accomplished provided some words are spent on whether avalanches/streamers can restart on the barrier side facing the grounded electrode, or not, when the applied voltage only causes corona activity and the barrier is introduced within the glowing region surrounding the point. In other words, this paper could be even incremental for that special and contiguous topic represented by surface aging due to corona activity. It is well known that aging affects the insulating barrier's surface facing the point but nothing is clearly expressed as regards the opposite side of thin barriers. The described circumstances are typical of some technological applications. Apart from this observation somehow pertaining to the treated subject-matter, the paper deserves to be published.	Surely, corona discharge will likely happen but that also leads to the volume ionization within the airgap. With a barrier in the gap, the positive charge in the streamer accumulates on the surface of the barrier that faces the needle. This charge modifies to uniform the electric field between the barrier and the plane electrode. The potential is almost equal all over the charged surface of the barrier. Practically, it means that the potential of the barrier becomes equal to the potential of the needle, as if, the test voltage is applied almost directly to the barrier plane gap. If the voltage is high enough the barrier-plane gap is bridged. This fact can be substantiated by placing a barrier at the tip of the point electrode. In this arrangement the voltage is not optimized but ionization and breakdown takes place like a plain air gap. That is, the field appears after the barrier as if the barrier was not there. That means it is possible that when the positive charge field appears uniformly on the surface of the barrier with equal field strength as the point electrode, avalanche initiation is possible. Remde and Boecker [13] likened the process as the charging of a capacitor, one plate being the size of the barrier that faces the needle and the other, the plate being the size of the barrier that faces the needle and the other the plane electrode. The more the load accumulates on the barrier, the voltage between barrier and plane becomes higher, while the voltage between the needle and barrier becomes lower. Therefore at a critical voltage, ionization could be initiated. The present work was not focused on the mechanism of breakdown that was why it was not discussed in the text.
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<u>Optional/General</u> comments		