Review Form 1.6

Journal Name:	**International Astronomy and Astrophysics Research Journal**
Manuscript Number:	**Ms_IAARJ_87548**
Title of the Manuscript:	**ON THE CENTRAL ENGINE OF THE COMPACT STEEP SPECTRUM SOURCE AND SOURCE PHENOMENA**
Type of the Article	**ORIGINAL RESEARCH ARTICLE**

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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.
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PART 1: Review Comments

Summary of the Work	**Reviewer's Comment:** ***Summary of the Work*** The aim of this work is to investigate the central engine which encapsulates a super massive blackhole. In a typical extragalactic radio source, the nucleus is the central engine. According to the author, the central engine of a typical compact steep spectrum (CSS) source drives the source observed physical phenomena. **Reviewer's Comment:** ***Main Results Obtained*** The authors provided with the expression of the power of the source central engine. According to the author's interpretation "*if some external factors are held fixed, the source central engine powers the observed physical properties and phenomena of the CSS source*".	**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	**CRc1)** Please justify Eq. (1) on page 3 of the manuscript by using the ***Buckingham π theorem***. As known, in dimensional analysis this theorem states that if there is a physically meaningful equation involving a certain number n of physical variables, then the original equation can be rewritten in terms of a set of p = n − k dimensionless parameters π_1, π_2, ...,π_p constructed from the original variables with k denoting the number of physical dimensions involved. For clarity, please, show all the expressions for π_j. **CRc2)** Assumption (9) (on page 4 of the manuscript) is very strong and a solid physical justification is required. Please, provide a comment about it. **CRc3)** Please re-obtain Eq. (13) and Eq. (17) on page 5 of the manuscript by using the ***Buckingham π theorem*****,** and compare this expression with the original equation (1). Notice that this exercise allows to understand the approximations made to obtain the final expressions, helping to provide a correct physical interpretation of them. **CRc4)** Eq. (19) shows the linear regression relating D with P. As known, in the linear regression analysis it is assumed that the cause-and-effect relationship between the variables remains unchanged. In the present work these variables correspond to the observed source linear sizes and the observed luminosities. This is a strong assumption and leads to two important observations: **CRc4a)** This hypothesis may not hold good during the evolution and, hence, estimation of the values of a variable made on the basis of the regression equation may lead to erroneous and misleading results; **CRc4b)** There is a compatibility issue concerning the application of the Buckingham π theorem. Indeed, if Eq. (17) may be derived by using the Buckingham π theorem (this expression is one of the above-mentioned π_j), then D and P cannot be linked each with other by an equation of the type (21) (leading with β ~ 0.0313). Note that hypothesis (9) may be at the origin of this (perhaps only apparent) incompatibility with the Buckingham π theorem. For clarity, in my opinion the author should mention and clarify these two issues. **CRc5)** Parameter β may be estimated from the Log(D)-Log(P) data. Another issue that deserves deep discussion is the extent of the errors. As known, experimental data in the *D-P plane* are quite prone to noise and overfitting. The author is then invited to include the estimation of the errors in the scatter plot of source observed linear sizes against observed luminosities.	
Minor REVISION comments	The work contains several gaps that need to be filled. In particular, **MRc1)** The analytical method and statistical method adopted by the author mainly refer to the dimensional analysis (see the starting point Eq. (1) in the manuscript). This requires a rigorous justification in terms of the Buckingham π theorem. **MRc2)** The regression expression (Eq. (19)) is obtained without estimating (or at least not reported) the magnitude of the errors. **MRc3)** The (strong) assumption (9) pop-ups without a physical explanation.	
Optional/General comments	The work is interestin, but is vulnerable under various aspects, including: - *the dimensional analysis*; - *the application of the linear regression hypothesis*; - *the physical justification of one of the key assumptions*. The suggestions expressed above (see Section "*Compulsory Revision comments*") are intended to fill some gaps. I therefore encourage the author to take into account the advice expressed above; this will provide more solidity to the work and will attract the reader more.	

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PART 2:

	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)*
Are there ethical issues in this manuscript?	***(If yes, Kindly please write down the ethical issues here in details)***	

Reviewer Details:

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