Cover Letter for Revised Manuscript Submission

Manuscript Reference Number: AOP 81029
Journal: Annals of Physics
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Dear Editor,

We are pleased to submit the revised version of our manuscript entitled "A Loop Quantum Gravity Inspired Action for the Bosonic String and Emergent Dimensions at Large Scales" (Reference Number: AOP 81029) for publication in Annals of Physics.

We have carefully addressed all comments and suggestions from the reviewers. A detailed point-by-point response is provided in the accompanying file "response-to-referee.pdf".

Author Name Change: One co-author has requested a name change from Luigi Teixeira de Sousa to Lin Teixeira de Sousa. We have contacted namechange@elsevier.com per Elsevier's inclusive author name change policy. This correction does not affect authorship contributions or order.

Summary of Revisions: Major improvements include: (1) Enhanced theoretical foundation with extensive discussions connecting our minimal area approach to existing minimal length proposals in string theory; (2) Clearer physical justification for the expansion parameter $k \ll 1$ and strengthened analogy with T/S-dualities; (3) Clarified anomaly-freedom claims, explaining this refers specifically to absence of central charge anomalies due to finite mode truncation; (4) Added important caveats about approach limitations; (5) Improved interpretation of emergent dimensions and their connection to holographic principles and cosmological horizon scale.

We confirm that: (i) all authors have reviewed and approved the revised manuscript; (ii) the manuscript has not been submitted elsewhere; (iii) all ethical guidelines have been followed; (iv) all necessary permissions have been obtained for copyrighted material.

We thank the reviewers for their constructive feedback and look forward to your favorable consideration.

Sincerely,

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Attachments: `response-to-referee.pdf` (detailed response), `resubmit-cover-letter.pdf` (cover letter), `lqg-strings.pdf` (revised manuscript), `lqg-strings-diff.pdf` (diff file), `lqg-strings.bib` & `lqg-strings.bbl` (bibliography files).