Review of: "An Approach to Robust Fatigue Life Prediction to Be Used in Early Design Stages"

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Potential competing interests: No potential competing interests to declare.

The current paper couples solid mechanics theories and quality management techniques to develop methodologies for design against fatigue loads. The work presented in the paper looks interesting and can be accepted for publication after the following revisions are made in the manuscript:

Comment 1: Proper validation of the proposed model is not provided in the manuscript. The authors may provide a graph showing the agreement achieved with the analytical or published solutions.

Comment 2: The authors have not reported grid independence studies to justify the mesh chosen for analysis. Numerical simulations without proper grid independent tests have no importance.

Comment 8: The literature review reported in the paper seems inadequate. Extensive literature review is available in this area. However, the authors have missed some very important and recent papers which are extremely close and related to the work reported in this area. Some of the recently published work, which deserves attention in this paper and should be added to the manuscript, is given below:

1. *A. Jameel, G. A. Harmain, "Fatigue Crack Growth in Presence of Material Discontinuities by EFGM", International Journal of Fatigue, Vol. 81, pp. 105–116, 2015. https://doi.org/10.1016/j.ijfatigue.2015.07.021*
2. *Moran B, Shih C F. A general treatment of crack tip contour integrals. International Journal of Fracture 1987;35(4):295–310. https://doi.org/10.1007/BF00276359*
3. *A. Jameel, G. A. Harmain, "Fatigue crack growth analysis of cracked specimens by the coupled finite element-element free Galerkin method", Mechanics of Advanced Materials and Structures, Vol. 26, pp. 1343–1356, 2019. https://doi.org/10.1080/15376494.2018.1432800*
4. *Mousavi SE, Grinspun E, Sukumar N. Higher-order extended finite elements with harmonic enrichment functions for complex crack problems. International Journal for Numerical Methods in Engineering 2010;0:1-29. https://doi.org/10.1002/nme.3098*
5. *A. Jameel, G. A. Harmain, "Large Deformation in Bi-material Components by XIGA and Coupled FE-IGA Techniques", Mechanics of Advanced Materials and Structures, Vol. 29, pp. 850–872, 2022. https://doi.org/10.1080/15376494.2020.1799120*
6. *S. A. Kanth, A. Jameel, G. A. Harmain, "Investigation of Fatigue Crack Growth in Engineering Components Containing Different Types of Material Irregularities by XFEM", Mechanics of Advanced Materials and Structures, Vol. 29 (24), pp. 3570-3587, 2022. https://doi.org/10.1080/15376494.2021.1907003*

7. *A. Jameel, G. A. Harmain, "Modeling and Numerical Simulation of Fatigue Crack Growth in Cracked Specimens Containing Material Discontinuities", Strength of Materials, Vol. 48, No. 2, pp. 294–307, 2016. https://doi.org/10.1007/s11223-016-9765-0*
8. *A. Jameel, G. A. Harmain, "A Coupled FE-IGA Technique for Modeling Fatigue Crack Growth in Engineering Materials", Mechanics of Advanced Materials and Structures, Vol. 26, pp. 1764–1775, 2019. https://doi.org/10.1080/15376494.2018.1446571*
9. *A. Jameel, G. A. Harmain, "Extended Iso-Geometric Analysis for modeling Three Dimensional Cracks", Mechanics of Advanced Materials and Structures, Vol. 26, pp. 915–923, 2019. https://doi.org/10.1080/15376494.2018.1430275*
10. *V. Gupta, Azher Jameel, S. K. Verma, S. Anand, Y. Anand,"An insight on NURBS based Isogeometric Analysis, its current status and involvement in Mechanical Applications" Archives of Computational Methods in Engineering (Springer), vol. 30, pp. 1187-1230, 2023.*