Optimal design of FG sandwich nanoplates using size-dependent isogeometric analysis

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PII: S0167-6636(19)30532-0
DOI: https://doi.org/10.1016/j.mechmat.2019.103277
Reference: MECMAT 103277

To appear in: *Mechanics of Materials*

Received date: 23 June 2019
Revised date: 28 November 2019
Accepted date: 8 December 2019

Please cite this article as: P. Phung-Van , Chien H. Thai , M. Abdel-Wahab , H. Nguyen-Xuan , Optimal design of FG sandwich nanoplates using size-dependent isogeometric analysis, *Mechanics of Materials* (2019), doi: https://doi.org/10.1016/j.mechmat.2019.103277

Highlights

- An effectively computational optimization approach for optimal design of FG sandwich nanoplates is proposed for the first time.
- The multi-patch B-spline basis functions through the thickness direction are used to approximate the ceramic volume faction distribution. This approach ensures smoothly and continuously vary material properties across each layer, and automatically satisfies the C^0-continuity at each layer interfaces
- The integration of the NURBS formulation and four variables refined plate theory and the Eringen's nonlocal elasticity is employed to capture the size effects.
- An adaptive hybrid evolutionary firefly algorithm with fast convergence speed and less computational cost is used for an optimizer.
- Several new results are obtained and considered as benchmark problems for further studies on the FG sandwich nanoplates.