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Limit Analysis of Circular Plates with Arbitrary Rotational Symmetric Loading Using Fourier Series Expansion

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Highlights

- This paper presents new solutions for the load carrying capacity of a circular plate subjected to arbitrary rotational symmetric loadings.
- Simply supported and clamped boundary conditions are considered.
- The lower bound method of limit analysis has been used together with the half-range Fourier series expansion of the loading function.
- The resulting nonlinear equation has been solved numerically using the Newton-Raphson algorithm.
- Since the obtained solution satisfies all of the requirements for an exact solution, it is in fact the exact critical load factor.
- The results have been verified against available findings in the literature.
- Finally, several new loading types for which no solution is currently available have been analyzed.

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