KOITER ASYMPTOTIC ANALYSIS IN TECHNICAL APPLICATIONS

Antonio Madeo\textsuperscript{1}, Giuseppe Zagari\textsuperscript{1}, Giovanni Zucco\textsuperscript{1},
Raffaele Zinno\textsuperscript{1} and Raffaele Casciaro\textsuperscript{1}

\textsuperscript{1} DIMES, University of Calabria, 87030 Arcavacata di Rende (Cosenza), Italy, 
\textsuperscript{*}antonio.madeo81@unical.it, giuseppe.zagari@unical.it, giovannizucco@gmail.com, 
zinno@unical.it, rcasciaro@gmail.com

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During the years, many researchers tried to make operative the asymptotic analysis ini-
tially proposed by Koiter [1] from numerical point of view. The method is considered very 
attractive for its advantages with respect to path–following approach. Mainly, these con-
sist in an accurate post–buckling analysis, with low computational cost, specially in the 

case of modal interaction and in an efficient imperfection sensitivity analysis. The main 
difficulties arise in the availability of geometrically coherent (almost until fourth order) 
structural model and in an accurate evaluation of their high order energy variations.

The use of corotational formulation, decomposing the geometrical nonlinearity from the 
estatic response, within a mixed formulation, allows to have a general, efficient and robust 
finite element implementation of Koiter analysis [2, 3]. Our more recent technology [4, 5], 
in terms of numerical implementation, is discussed and extended to a large scale analysis 
of structures of technical interest. The academic context in which Koiter approach is 
often traditionally confined are overcame and the accuracy and reliability of the method 
are shown in real technical contexts.

REFERENCES


derivation of nonlinear structural models for beams and plates. \textit{Journal of Mechanics 
