Eight International Conference on Application
of Mathematics in Technical and Natural Sciences
22 – 27 June 2016, Albena, Bulgaria

BOOK OF ABSTRACTS

Euro-American Consortium for Promoting the Application
of Mathematics in Technical and Natural Sciences

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But the parameters of these limit cycles can differ greatly. In this paper, we compares in detail the time behavior of income $Y(t)$ for the business cycle models (1) and (2).

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Hierarchy of Bases for Serendipity Finite Element with the Biquadratic Interpolation

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Recently the interpolation bases of the hierarchical type have been used for the problem solving of the approximation of multiple arguments functions (such as in the finite-element method). The bases of the hierarchical type are effectively used in the adaptive refinement procedures, which are based on the posteriori error estimates for the finite-element solution. When using hierarchical finite-elements (FE), it is easy to add a multiple element locally, in order to make an adjustment in the area, where the searched function changes very quickly; and the approximation can produce great errors. Nowadays the mostly developed questions are the ones of the building of hierarchical bases on one-dimensional and three-angled FEs. But there is very little information about the hierarchy of the models on serendipity finite elements (SFE) in the famous monographs; and only the standard type bases are given. The great interest is aroused in learning of the possibility of increasing of the degree of serendipity polynomials by means of introducing of new terms by the fixed number of nodes of the interpolation. It is clear that the common method of the inverse matrix does not fit in this case, and the new innovative approaches are needed.

In this work the cognitive graphical method of constructing of the hierarchical form bases on the serendipity finite elements is suggested, which allowed to get the alternative bases on a biquadratic finite element from the serendipity family without internal knots' including. The modified bases on SFE-8 have nine parameters in the interpolation polynomial: one "hidden" parameter is added to the standard polynomial, whose presence provides the endless number of infinite bases on this item. The cognitive-graphic method allowed to improve the known interpolation procedure of Taylor and to get the modified elements with irregular arrangement of knots.

The study of the influence of the "hidden"parameters on the quality of the approximation arouses the interest itself, that is why the tests of the alternative bases of the biquadratic serendipity finite element were performed while solving problems of the elliptic type. It was proved that on the biquadratic SFEs the best computational abilities belong to the basis, by which the stiffness matrix has a minimum trace. The proposed procedures are universal and are spread in the area of FE.

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Super-Solitons and Mixed Solutions for Defocusing Super-Gardner Equation

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Applying the Hirota super-bilinear formalism we discuss the supersymmetric version of defocusing Gardner equation. After constructing the super-solitons, we notice that in some conditions the equation under consideration admits super-shock wave solutions. We also build a mixed solution containing one super-soliton and one super-shock and analyse its dynamics. The integrability of defocusing super-Gardner equation is also discussed.

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