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ELASTIC CUSPED BEAM, PLATE, AND SHELL MATHEMATICAL MODELS AND THEIR RELATION TO THE 3D CLASSICAL LINEAR MODELS

The present paper gives an up-dated exploratory survey of investigations concerning elastic cusped beams (i.e., the areas of their cross-sections may be equal to zero at their ends) [1,2], cusped plates and shells (i.e., their thicknesses may vanish either on some parts of their projection boundaries or on the whole ones) [3-5]. The relation of such 2D classical and hierarchical mathematical models to physical models (i.e., objects under study) and to the 3D classical linear model is also studied. Along with the analysis of well-known results it contains some new and unpublished results as well.

References

- [1] **Jaiani, G.V.:** On a mathematical model of bars with variable rectangular cross-sections. *ZAMM-Zeitschrift fuer Angewandte Mathematik und mechanik* **81, 3:** 147-173, 2001.
- [2] **Jaiani, G.V.:** Theory of Cusped Euler-Bernoulli Beams and Kirchhoff-Love Plates. *Lecture Notes of TICMI (Tbilisi International Centre of Mathematics and Informatics* **3**, 2002.
- [3] **Jaiani, G.V.:** Elastic bodies with non-smooth boundaries—cusped plates and shells. *ZAMM-Zeitschrift fuer Angewandte Mathematik und mechanik* **76, 2:** 117-120, 1996.
- [4] **Jaiani, G., Kharibegashvili, S., Natroshvili, D., Wendland, W.L.:** Hierarchical Models for Cusped Plates and Beams. *Lecture Notes of TICMI (Tbilisi International Centre of Mathematics and Informatics* **4**, 2003.
- [5] **Vekua, I.N.:** Shell Theory: General Methods of Construction. *Pitman Advanced Publishing Program, Boston-London-Melbourne* 1985.