YET ANOTHER MATHEMATICAL MODEL OF EGGS: TWO-PARAMETRIC BRANDT'S SHAPES

CLEMENTINA D. MLADENOVA[1] and IVAÏLO M. MLADENOV[1,2]

Presented by Ivaïlo M. Mladenov

The explanation of the perfect forms in nature is a subject which has attracted a great attention since the beginning of our civilization. E.g., despite the longstanding interest in the shapes of the eggs, the available parametric descriptions in the modern literature are given only via purely empirical formulas without any clear relationships with their measurable parameters.

Here we are exploring another geometrical model suggested by G. Brandt long time ago but which has not received any proper treatment. Actually, it is based on fourth order plane algebraic curve for which we have derived several parameterizations. The most interesting of them is the uniformization of the curve via the Jacobian elliptic functions. Some comparisons with the experimental results were made but this subject deserves further investigation.

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1. Introduction

Recently, a new model of the eggs [7, 8] based on Perseus spirics [5] has been developed. As usual, before starting to work on it, a detailed study of the existing models in the literature was undertaken. And for a big surprise, it turns out that neither of them has the necessary capacity in order to be named a "model".

Most of the candidates are presented by some empirical formulas which mimics the oval shapes (an almost exhaustive list of such"models" can be found in [3]), i.e., the authors were satisfied only by the qualitative resemblances of the ovals with the forms found in the nature. As this situation is more than strange, we have decided to start series of short reviews in which the existing "models" are covered in some depth and where possible – appropriately extended.