Diferenciálne rovnice v biomechanike
Differential Equations in Biomechanics

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Abstract: Biomechanics deals with biomaterials, observes and investigates their behavior first of all as the response to the mechanical load. During the attempt the researcher has to cope with many problems sourcing of "motion of live". The biomechanical modeling includes four basic steps: geometry creation, material properties acquiring, mathematical and computational treatment and results validation.
Though the biomaterials obey the physical laws, nevertheless due to live – tireless change, development, growing is not easy to grip the investigated domain. Some geometrical properties and the physical parameters can be measured or stipulated "in vivo" by using the non invasive or invasive methods; others are measured just on the dead specimen.
The mathematical elaboration includes the governing equation assessing, the appropriate method selecting and the computer implementation.
In the paper two models governed by differential equations are introduced. The first one describes the mathematical modeling of the motion segment of the human lumbar spine. The elastic response by the biological domain (motion segment) is governed by the Lamé equations. The second one, the rheological model describes the behavior of material which is neither wholly elastic nor wholly plastic.

References

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