

## **Mathematical modeling and simulation of the coupled strain space thermoplasticity problems**

### **ABSTRACT**

Using the strain space thermoplasticity theory, proposed by the first author, the coupled dynamic thermomechanical boundary value problems are formulated. The strain space thermoplasticity theory, in contrast to the existing one, allows to formulate the coupled thermoplastic boundary value problems for the displacement and temperature increments. The explicit and implicit finite difference equations for two dimensions case of the boundary value problems are constructed. The numerical solution of the explicit finite difference equations reduced to the application of the recurrent formulas, whereas the implicit scheme reduced to the application of the elimination method. Comparison shows that the numerical results obtained using the explicit and implicit schemes for aforementioned methods are coincides.