

Nonsmooth Problems with Applications in Mechanics
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**Coulomb and Fourier Friction Laws for Nonlinear Elasticity Problem
with Sobolev Spaces with Variables Exponent**

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Abstract: We consider a nonlinear elasticity problem in a bounded domain, its boundary is decomposed in three parts: lower, upper and lateral. The displacement of the substance, which is the unknown of the problem, is assumed to satisfy the homogeneous Dirichlet boundary condition on the upper part, and Fourier boundary condition on the lateral boundary, while on the lower part, Coulomb friction law is considered. The problem is governed by a particular constitutive law of elasticity system with a strongly nonlinear stress tensor. The functional framework leads to use Sobolev spaces with variables exponents. The formulation of the problem leads to a variational inequality, for which we prove an existence result by Galerkin method with monotone operator theory and fixed point method.