

Mechanical properties and damage constitutive model of frozen brain tumors under cryogenic-mechanical coupling effect

Numerical simulation of consol

Temperature

Mechanical force

coupling

Temperature distribution

The accuracy of ablation was preliminarily determined

Stress-strain distribution of numerical simulations

$$\sigma_{1t} = [E_T \varepsilon_{1t} + (1 - 2\nu)\sigma_3] \cdot \frac{E_T}{E_0} \cdot \exp \left[- \left(\frac{K\varepsilon_1 + 2\mu\sigma_3 + \sigma_0}{F_0(\sigma_3 + \sigma_0)} \right)^m \right] + (2\nu - 1)\sigma_3$$

Comparison of the theoretical stress-strain curves with the simulated curves showed good agreement with both curves.

