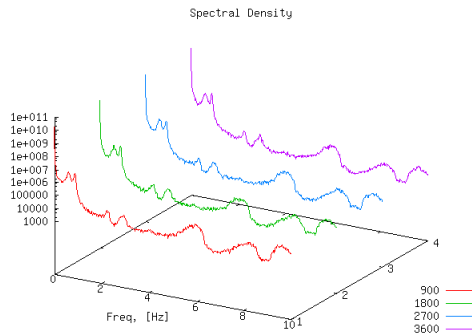## Test Data Analysis

Spectral density
Shock response spectra (SRS)
Visualization plots

Spectral Density

Shock And Vibration Requirements

Shock response spectra definition
Random environments definition
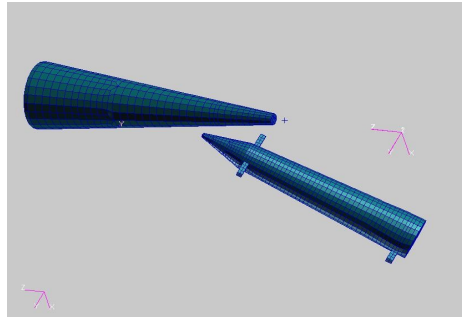
Machinery Diagnostics

Machinery malfunction identification
Asset condition monitoring

Software Development

Scientific Algorithms
Finite element code
Shell Script Automation
Signal Processing

Shock/Impact Analysis

Missile Lethality
Shock Reduction/Isolation
Shock response spectra prediction
Crashworthiness/human survivability

Failure Analysis

Fracture control
Fatigue crack propagation
Metallurgical assessment
Product weak point identification
Design change recommendations

Surface Engineering

Rolling Element Modeling
Surface Coatings Evaluation
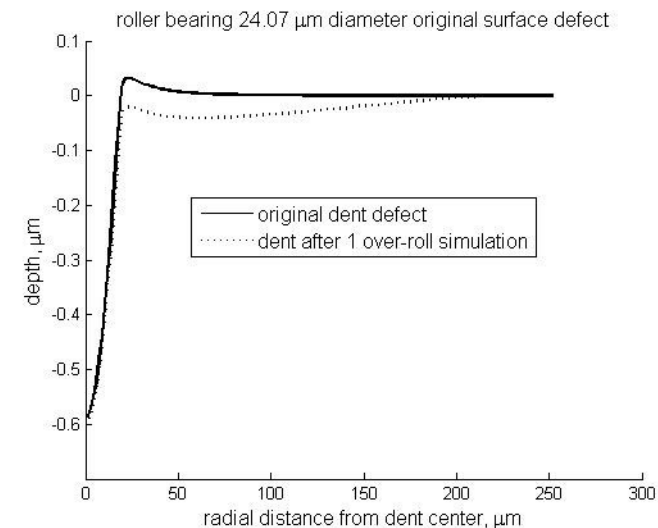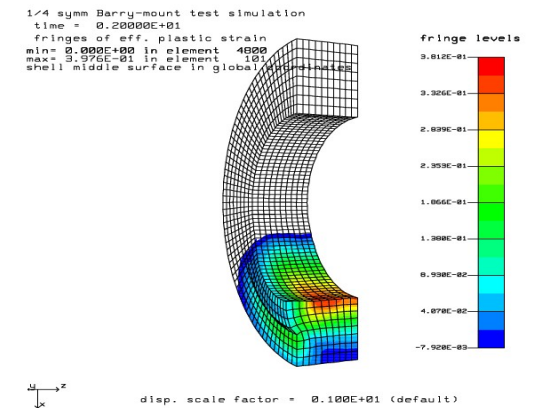Effect of Surface Defects Evaluation

Finite Element Analysis

Model development and verification
Static, dynamic, and frequency
Transient, frequency response, random
Combined thermal and mechanical

Nonlinear Analysis

Large deformation geometry
Material modeling
- Elastic-plastic
- Material failure
- Fiber composites damage
- Soil and crushable foam

roller bearing 24.07 µm diameter original surface defect

MISSION

To provide solutions to complex problems that exceed customer expectations. This is accomplished by continued expansion and improvement of technical capabilities and open customer communication.

OPERATING PRINCIPLES

Nonlinear Solutions strives to operate in a way that honors the Savior, Jesus Christ by following His example in the way we treat customers, business partners and employees:

- Respect and courtesy
- Honesty and integrity
- Quality of services provided
- Committed to customer satisfaction
- Clearly defined work statements
- Frequent communication
- No surprises

CALL OR EMAIL YOUR JOB DESCRIPTION FOR A PRICE QUOTE

Nonlinear Solutions uses the following Lawrence Livermore finite element codes:

- **DYNA2D**: Nonlinear 2D explicit dynamics
- **DYNA3D**: Nonlinear 3D explicit dynamics
- **NIKE2D**: Nonlinear 2D Implicit dynamics and statics
- **NIKE3D**: Nonlinear 3D Implicit dynamics and statics
- **TOPAZ2D**: 2D Heat Transfer
- **TOPAZ3D**: 3D Heat Transfer
- **MAZE**: 2D Mesh Generator
- **INGRID**: 3D Mesh Generator
- **GRIZ**: Results Visualization

Collaborator with codes since 1993.

NONLINEAR SOLUTIONS LLC
4358 Old Railroad Bed Rd
Harvest, AL 35749
(256) 541-5834 cell

mike.howell@nonlinear-solution.com

www.nonlinear-solution.com

NONLINEAR SOLUTIONS LLC

SOLUTIONS

FOR

COMPLEX

PROBLEMS

Nonlinear Solutions is a small, woman owned, disadvantaged business providing:

Structural Analysis

Test Data Analysis

Fatigue/Fracture Analysis

Failure Analysis

Analysis Software Development

Independent Assessment