

**PACKAGE ID** - 001107MLTPL00 GRIZ\*

**KWIC TITLE** - Finite Element Results Visualization for  
Unstructured Grids

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**LIMITATION CODE** -COPY                   **AUDIENCE CODE** - LIM

**COMPLETION DATE** - 04/19/1996   **PUBLICATION DATE** - 03/01/1996

**DESCRIPTION** - GRIZ is a general-purpose post-processing application supporting interactive visualization of finite element analysis results on unstructured grids. In addition to basic pseudocolor renderings of state variables over the mesh surface, GRIZ provides modern visualization techniques such as isocontours and isosurfaces, cutting planes, vector field display, and particle traces. GRIZ accepts both command-line and mouse-driven input, and is portable to virtually any UNIX platform which provides Motif and OpenGL libraries.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; Installation Guides for SUN, IBM, and SGI; Media Includes Source Code, Compilation Instructions, Linking Instructions, User Guide;

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - 1 CD ROM

**METHOD OF SOLUTION** - GRIZ interpolates element-based results back to the mesh nodes using volume-weighted averaging. The nodal values are used to interpolate into a colormap to determine the color at each node. Visible element faces, with their associated vertex (nodal) colors are rendered using the OpenGL graphics library.

**COMPUTER** - MLT-PLTFM

**OPERATING SYSTEMS** - UNIX

**PROGRAMMING LANGUAGES** - C

**SOFTWARE LIMITATIONS** - Limited by constraints of dynamic memory allocation on host computer.

**SOURCE CODE AVAILABLE (Y/N)** - Y

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**UNIQUE FEATURES** - Visualization of 3D and 2D engineering results on unstructured grids; fringe (pseudocolor) plots; isosurfaces; isocontours; cutting planes; vector field display; vector carpets; particle traces; reflection planes; time-series plots; results animation; flexible control by material; flexible lighting; graphical and command-line control; hardcopy and image file output; scripting.

**RELATED SOFTWARE** - Supersedes TAURUS finite element post-processor. Input files created in TAURUS Plotfile Format by finite element analysis codes DYNA, NIKE, and TOPAZ.

**OTHER PROG/OPER SYS INFO** - Requires Motif and OpenGL libraries. The DIGLIB code is included with the package.

**HARDWARE REQS** - The source distribution requires 8.22 Mbytes, uncompressed. However, only 20% of this is required for compilation; the rest is documentation and sample data files. The binary (32-bit) is approximately 500 Kbyte. Additional memory requirements during execution are dependent upon the size of the finite element mesh being post-processed.

**TIME REQUIREMENTS** - Initialization and rendering are highly dependent upon the size of the finite element mesh being post-processed, the type (s) of elements in the mesh, and the availability of hardware acceleration for rendering operations. Small meshes (less than 1000 elements) may take only seconds to initialize and each frame may render in much less than a second; very large meshes (>500000 elements) may take 20 minutes or more to initialize and 10 minutes or more to render each frame.

**REFERENCES** - Douglas E. Speck and Donald J Dovey, GRIZ, Finite Element Analysis Results Visualization for Unstructured Grids, User Manual, UCRL-MA-115696 Rev.1, March 1996.

**ABSTRACT STATUS** - Submitted July 1996. Released screened 8/8/96.

**SUBJECT CLASS CODE** - NHI

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
G CODES  
MANUALS  
FINITE ELEMENT METHOD  
THREE-DIMENSIONAL CALCULATIONS  
COMPUTER GRAPHICS  
ROTATION  
D CODES  
N CODES  
FLOW VISUALIZATION

**EDB SUBJECT CATEGORIES** -  
990200

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**SPONSOR** - DOE/ER

**PACKAGE TYPE** - SCREENED