

**PACKAGE ID** - 000186I367500 ATHENA-IV

**KWIC TITLE** - Inelastic Scattering Form Factors

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**LIMITATION CODE** - UNL                    **AUDIENCE CODE** - UNL

**COMPLETION DATE** - 12/01/1970    **PUBLICATION DATE** - 09/05/1969

**DESCRIPTION** - ATHENA-IV computes form factors for inelastic scattering calculations, using single-particle wave functions that are eigenstates of motion in either a Woods-Saxon potential well or a harmonic oscillator well. Two-body forces of Gauss, Coulomb, Yukawa, and a sum of cut-off Yukawa radial dependences are available.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; ORNL-TM-2703;  
Media Includes Source Code, Sample Problem;

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - 1 CD Rom

**COMPUTER** - IBM360/75

**OPERATING SYSTEMS** - OS/360

**PROGRAMMING LANGUAGES** - FORTRAN IV

**SOFTWARE LIMITATIONS** - Maxima of 100 wave function components and 10 interaction components. The reduced matrix elements of the one-body multipole operators may be included automatically in the wave function coefficients. Non-local effects on the wave functions may be included in the local energy approximation.

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

**RELATED SOFTWARE** - ATHENA4 is a revised and updated version of the original ATHENA code. It can punch the form factors on cards in a

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**RELATED SOFTWARE - (CONT)** format suitable for input to the DWBA code  
JULIE.

**TIME REQUIREMENTS** - About 2 minutes are required for the sample  
problem.

**REFERENCES** - F.S. Chwieroth, J.I. Dodson, M.B. Johnson, L.W. Owen, and  
G.R. Satchler, Form Factors for Inelastic Scattering, The Code  
ATHENA IV, ORNL-TM-2703, September 5, 1969, and Corrigenda, April  
1970.

**ABSTRACT STATUS** - Abstract first distributed December 1970. IBM360  
version submitted November 1969, sample problem executed by NESC.

**SUBJECT CLASS CODE** - AW

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
A CODES  
FORM FACTORS  
WAVE FUNCTIONS  
WOODS-SAXON POTENTIAL  
INELASTIC SCATTERING  
CROSS SECTIONS  
POTENTIAL SCATTERING  
NUCLEAR MODELS

**EDB SUBJECT CATEGORIES** -  
990200 663300

**SPONSOR** - DOE/ER

**PACKAGE TYPE** - TESTED