

PACKAGE ID - 001331I037000 R102

KWIC TITLE - Inverse Kinetics

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

COMPLETION DATE - 10/01/1976 **PUBLICATION DATE** - 10/01/1976

DESCRIPTION - Given the space-independent, one energy group reactor kinetics equations and the initial conditions, this program determines the time variation of reactivity required to produce the given input of flux-time data.

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - Media Directory; Software Abstract; Media Includes Source, Sample Problem Input and Output Data, Information;/ 1 CD Rom

METHOD OF SOLUTION - Time derivatives of neutron density are obtained by application of (a) five-point quartic, (b) three-point parabolic, (c) five-point least-mean-square cubic, (d) five-point least-mean-square parabolic, or (e) five-point least-mean-square linear formulas to the neutron density or to the natural logarithm of the neutron density. Between each data point the neutron density is assumed to be (a) exponential (third order polynomial), (b) exponential, or (c) linear. Changes in reactivity between data points are obtained algebraically from the kinetics equations, neutron density derivatives, and the algebraic representation of neutron density. First and second time derivatives of the reactivity are obtained by use of any of the formulae applicable to the neutron density.

COMPUTER - IBM370

OPERATING SYSTEMS - OS/360

PROGRAMMING LANGUAGES - FORTRAN-IV

SOFTWARE LIMITATIONS - Maxima of 50 delay groups, 1000 data points, 99 data blocks (A data block is a sequence of input points characterized by a fixed time-interval between points, a smoothing option, and a number of repetitions of the smoothing option).

SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - this program has been used for the determination of feedback parameters, control rod design, and evaluation of control rod worth. Various modes of solution allow high precision with analytic data or the analysis of digitalized data from recording

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UNIQUE FEATURES - (CONT) equipment. Smoothing of input data may be obtained by single or repeated application of five-point cubic, five-point parabolic, three-point linear, or five-point linear least-mean-square smoothing formulae. Tabular output includes excess reactivity, its first and second derivatives, input and smoothed input data, integral of neutron density, and instantaneous period. Precursor data may be input or obtained from the program library. Steady-state initial conditions may be specified by input of a constant reactivity or period. Non-steady-state conditions require precursor density information. Discontinuous changes in reactivity may be given as input or calculated by the program. Any number of reruns with varying solution modes and smoothing options may be scheduled.

RELATED SOFTWARE - This program supercedes RE138 and RE171, ANL IBM704 programs.

ABSTRACT STATUS - Released tested 3/20/2000

SUBJECT CLASS CODE - Z

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
R CODES
DATA

EDB SUBJECT CATEGORIES -
990200

SPONSOR - NEA

PACKAGE TYPE - TESTED