

**PACKAGE ID** - 000428IBMPC00 POISSON,SUPERFISH

**KWIC TITLE** - POISSON, SUPERFISH, Magnet and RF Cavity  
Design

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

**COMPLETION DATE** - 04/01/1992   **PUBLICATION DATE** - 04/01/1992

**DESCRIPTION** - POISSON,SUPERFISH is a group of codes that solve Poisson's equation and are used to compute field quality for both magnets and fixed electric potentials and RF cavity codes that calculate resonant frequencies and field distributions of the fundamental and higher modes. The group includes: POISSON, PANDIRA, SUPERFISH, AUTOMESH, LATTICE, FORCE, MIRT, PAN-T, TEKPLOT, SF01, and SHY.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; LA-UR-87-126;  
LA-UR-87-115

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - 3 3.5 Diskettes

**METHOD OF SOLUTION** - The POISSON group of codes solves Maxwell's static equations (MSE's) in integral form and in two dimensions. When the MSE's are taken together with the boundary conditions, they are equivalent to a generalized form of Poisson's equations in two dimensions. POISSON uses a successive point over-relaxation method to solve the equations, while PANDIRA directly solves the block tridiagonal system of difference equations, and iteration is required only for nonlinear problems. SUPERFISH uses the same direct solution method as PANDIRA for the Helmholtz eigenvalue problem.

**COMPUTER** - IBM PC

**OPERATING SYSTEMS** - DOS/MS-DOS 3.3 or above

**PROGRAMMING LANGUAGES** - FORTRAN - Compiler used is a Lahey F77L-EM/32,  
version 4.02 with OS/386 Memory Manager.

**SOFTWARE LIMITATIONS** - POISSON 16000 mesh points, 30 regions. SUPERFISH  
32000 mesh points, 125 max value for kmax and/or lmax, 60 segments  
and 30 regions.

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

**UNIQUE FEATURES** - Application of widely-used accelerator design codes  
on PC.

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**UNIQUE FEATURES - (CONT)**

**RELATED SOFTWARE** - This version supersedes an earlier PC version of the basic codes of the series. This earlier version was not made available.

**OTHER PROG/OPER SYS INFO** - The TEKPLOT program requires the proprietary Tektronix PLOT10 subroutines INITT, CHRISZ, TERM, NEWPAG, AOUTST, ANMODE, MOVABS, DRWABS, and TINPUT; these routines are not included.

**HARDWARE REQS** - To run SUPERFISH a temporary work space is required; for large cases this could be as much as 25 Mbytes, 8 Mb Memory and Math Coprocessor.

**TIME REQUIREMENTS** - This is variable depending on the PC configuration, clock rate etc, For SUPERFISH the DTL sample can be run under 5 minutes on a GATEWAY/486 system. For POISSON Hmag sample the run time is approximately 5 minutes.

**REFERENCES** - M.T. Menzel and H.K. Stokes, User's Guide for the POISSON/SUPERFISH Group of Codes, LA-UR-87-115, January 1987; POISSON Group Programs User's Guide, Los Alamos National Laboratory memorandum, February 14, 1981; Los Alamos Accelerator Code Group, Reference Manual for the POISSON/SUPERFISH Group of Codes, LA-UR-87-126.

**ABSTRACT STATUS** - Abstract first distributed February 1991. IBM PC version submitted April 1992.

**SUBJECT CLASS CODE** - V

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
P CODES  
POISSON EQUATION  
THREE-DIMENSIONAL CALCULATIONS  
TWO-DIMENSIONAL CALCULATIONS  
MAGNETIC FIELDS  
MESH GENERATION

**EDB SUBJECT CATEGORIES** -

990200 430200

**SPONSOR** - DOE/ER

**PACKAGE TYPE** - SCREENED