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Computer Code Abstract

GRAD SQUARE

1. Code: GRAD SQUARE
2. Computer for which code is designed: IBM 709
   Programming system: FORTRAN II
3. Nature of problem solved: This code solves an integral form of the one-speed neutron transport equation for a neutron detector foil placed in a large moderating medium. The foil may be of arbitrary dimensions, so long as it is rectangular in shape. The initial flux may be flat or it may have arbitrary first or second spatial derivatives with arbitrary orientation with respect to the foil. The code calculates the disturbed flux at up to 1000 points inside the detector and an unlimited number of points located in arbitrary regions outside the detector.
4. Restrictions:
   Only one neutron speed
   Only one rectangular foil
   Only zeroth, first and second derivatives in the initial flux
   Only 1000 points interval to the detector.
5. Typical running time: One to two min for 125 points, the time required should increase as the square of the number of points.
6. Unusual features: None.
7. Present status: In use for past year.
8. References: 1. G. R. Dalton and R. K. Osborn, "Flux Perturbations by Thermal Neutron Detectors," *Nucl. Sci. Eng.* **9,** 198-210 (February 1961).
   2. G. R. Dalton and R. K. Osborn, "The Effects of Flux Anisotropy on Neutron Detector Foils," *Nucl. Sci. Eng.* (this issue, p. 481).

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