

A MICROSCOPIC-DISCRETE
THEORY OF THERMAL-NEUTRON PILES

by
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ABSTRACT

The idea of taking account of the lattice structure of a reactor by representing each rod by a line source of fast neutrons and a line sink of thermal neutrons seems to have occurred independently to different workers in different countries: Teller and Horning in U.S.A., Galanin and Feinberg in U.S.S.R., and J.D. Stewart in Canada. This present report is a reissue of a classified Chalk River report on this subject, NEI-13 first issued in July, 1952. It describes the method and its application to the problem of determining the Laplacian of a new lattice by substituting some rods of it for rods of a lattice of known Laplacian. The value thus deduced for the Laplacian of NRU, which was not given in the original report, was $5.6 \pm 0.2 \text{ m}^{-2}$; later a critical experiment on a full lattice of NRU rods gave the value 5.81 , for a rod spacing of 6.81 " in a hexagonal lattice.

No changes have been made in the original text except for the correction of a few typographical errors.

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