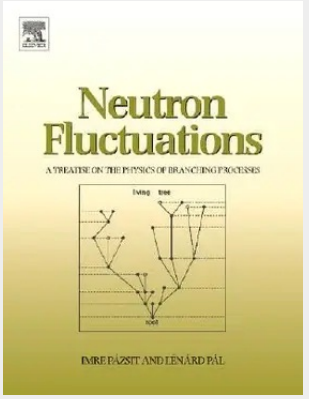
Pazsit / Pal

Neutron Fluctuations

A Treatise on the Physics of Branching Processes



The transport of neutrons in a multiplying system is an area of branching processes with a clear formalism. Neutron Fluctuations presents an account of the mathematical tools used in describing branching processes, which are then used to derive a large number of properties of the neutron distribution in multiplying systems with or without an external source. In the second part of the book, the theory is applied to the description of the neutron fluctuations in nuclear reactor cores as well as in small samples of fissile material. The question of how to extract information about the system under study is discussed. In particular the measurement of the reactivity of subcritical cores, driven with various Poisson and non-Poisson (pulsed) sources, and the identification of fissile material samples, is illustrated. The book gives pragmatic information for those planning and executing and evaluating experiments on such systems.

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