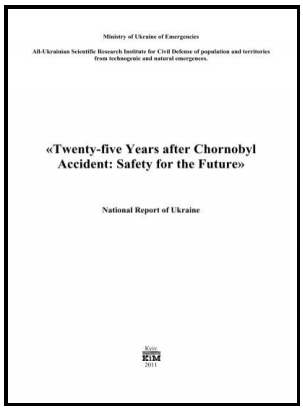
New approximate analysis of nonlinear space-dependent reactor dynamics due to reactivity accidents

Kyoto University - Development of a neural simulator for research reactor dynamics



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Analysis of the Chimney Effect During the Reflooding Phase of a Large Break LOCA Transient With the 3D Module of the CATHARE2 Code

Stiff differential equations frequently arise in physical situation characterized by the existence of greatly differing time constants and are common in particular to such other fields as common engineering applications, circuit analysis, missile guidance system, chemical engineering, and chemical analysis. For predictions, it is necessary to know i parameters of particle-material interaction such as diffusion, binding energies of H isotope with different kinds of defects, recombination, reflection and sputtering coefficients, etc.

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Such is the case with reactor control. Furthermore, it is seen that exclusion of secondary heat transfer loops in models leads to underestimation of transient peaks and troughs. Reactor constituents change continuously during operation and immediately at restart after refueling.

Nuclear Reactor Physics

Using neutrons for research enables us to investigate the world around us, as well as to develop new materials and processes to meet the needs of the society. For example, stored energy in a typical PWR can provide around 10 full power seconds per psi of pressure drop.

Fluidized Bed Nuclear Reactor

The startup process of a nuclear reactor requires that reactivity is varied in the system by lifting the control rods discontinuously. A model with n equations is called an n-th order state variable model. For a value, K ¼ 5, the system has damped oscillatory behavior and is stable.

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