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Prediction of Oscillations of the Thermodynamic Parameters of the Cooling System of the IBR-2M Reactor Using Neural Nets

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The problem of predicting the oscillations of the main thermodynamic parameters of the core in the first loop of the sodium cooling system of IBR-2M reactor is examined. Attention is focused mainly on the prediction of the temperature and sodium flow at the entry into the core as well as the thermal power. It is shown that the prediction makes it possible to reduce by a factor of 3 the influence of slow oscillations of reactivity on the power and thereby reduce the operational requirements for the automatic power stabilization system. Neural-net prediction using nonlinear autoregression nets with feedback is proposed. The results agree with experiment to within ~5%.

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