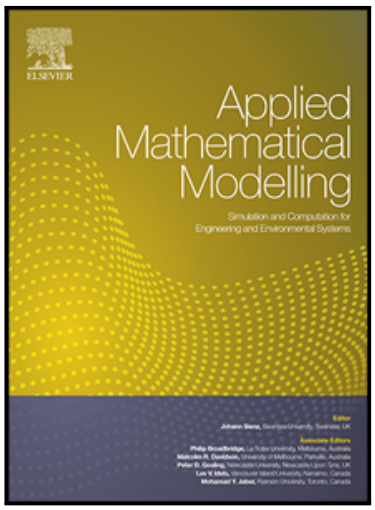

Mathematical modeling of pressurizer in pressurized water reactor for controller design

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Highlights

- A nonequilibrium **nonlinear** three-region pressurizer model was proposed and linearized.
- Transfer function models of pressurizer during in- and out-surge transients were developed for controller design.
- Pressure and water level controllers of a small PWR pressurizer were designed based on the transfer function models.
- Simulation studies **show effectiveness of the pressurizer models and robustness of the designed controllers**.