System identification experiments are often expensive and time-consuming. Therefore, it is important to find the most expedient means of performing the plant tests, in order to minimize the disruption to the plant. This research addresses theoretical and practical issues related to efficient and accurate system identification. This research has investigated the relative merits of simultaneous vs. sequential input excitation during plant tests. Simultaneous, sequential, and specially-designed rotated input sequences were examined in a simulation case study involving the Wood-Berry distillation column model. The results showed that simultaneous input excitation allows the test duration to be reduced by as much as 30%, even while still identifying models with comparable accuracy as the standard, sequential-input testing.

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