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Pricing in Day-Ahead Electricity Markets with Near-Optimal Unit Commitment

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Abstract   This paper revisits some peculiar pricing properties of near-optimal unit commitment solutions. Previous work has found that prices can behave erratically even as unit commitment solutions approach the optimal solution, resulting in potentially large wealth transfers due to suboptimality of the solution. Our analysis considers how recently proposed pricing models affect this behavior. Results demonstrate a previously unknown property of one of these pricing models, called approximate Convex Hull Pricing (aCHP), that eliminates erratic price behavior, and therefore limits wealth transfers with respect to the optimal unit commitment solution. The absence of wealth transfers may imply fewer strategic bidding incentives, which could enhance market efficiency.

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