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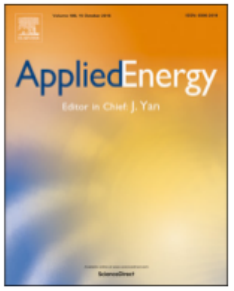

Characterizing the energy flexibility of buildings and districts

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- Penalty based setup
- Energy flexibility characterization
- Example

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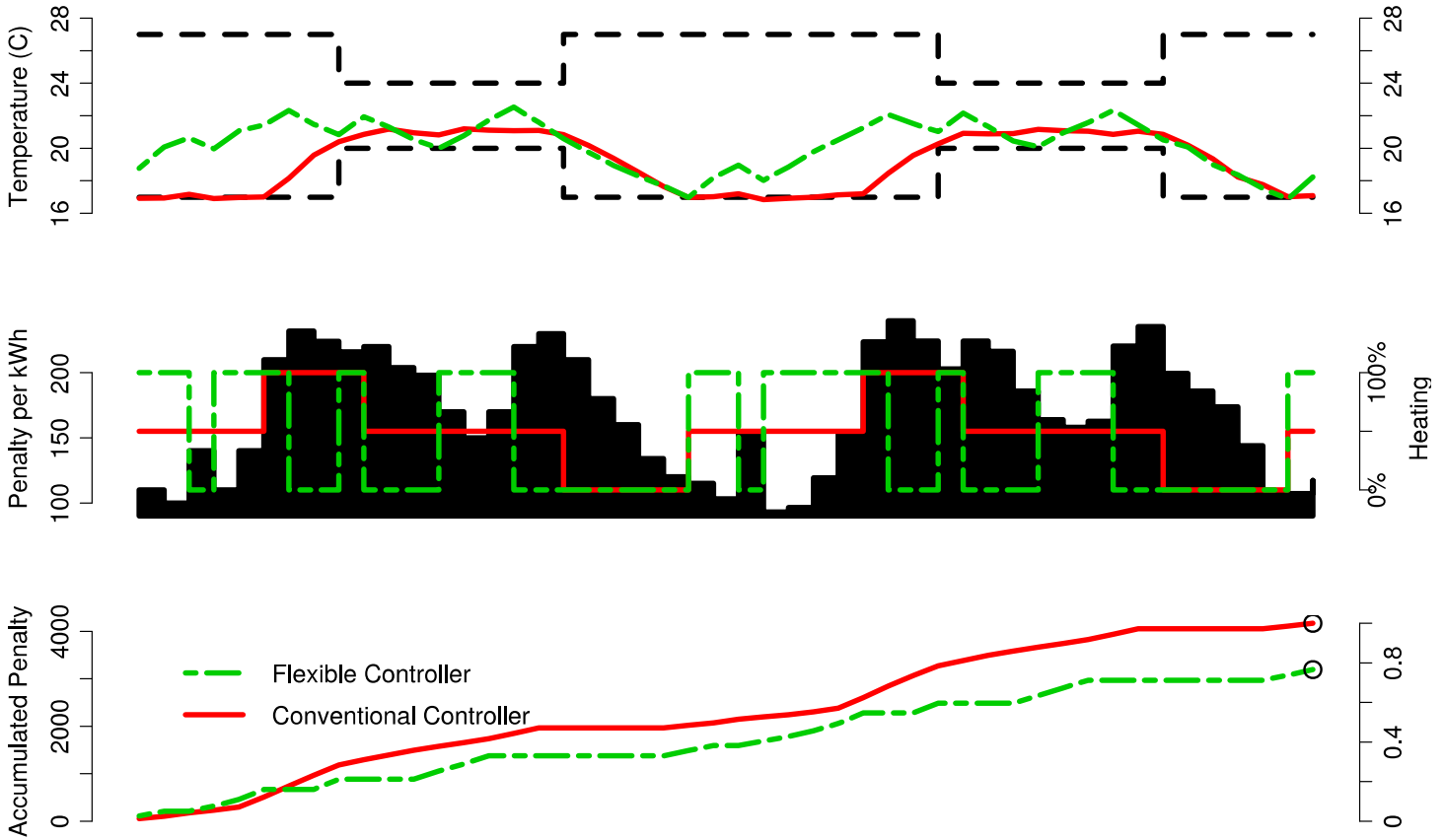
Penalty based setup



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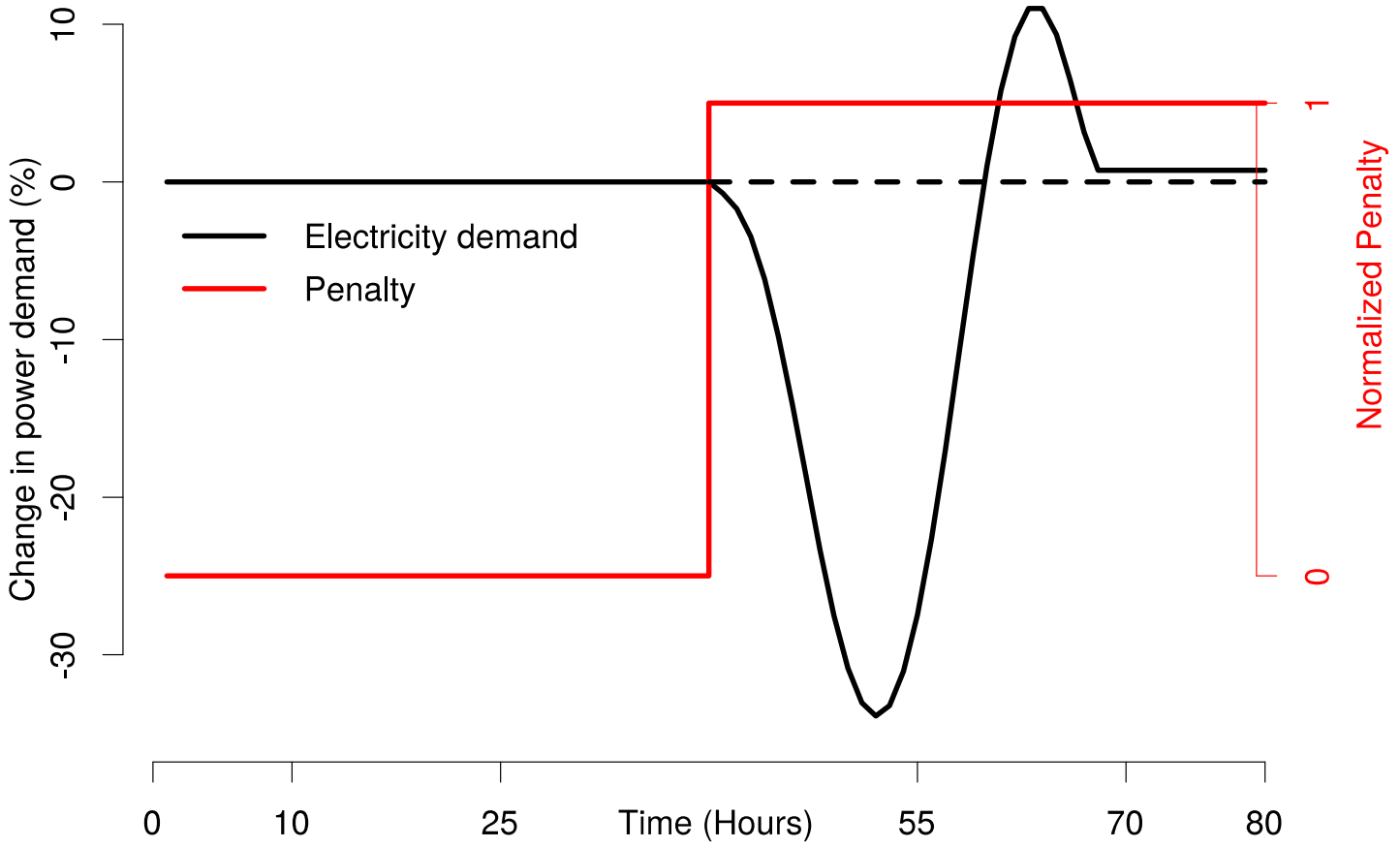
Flexibility Function of Indoor Swimming Pool



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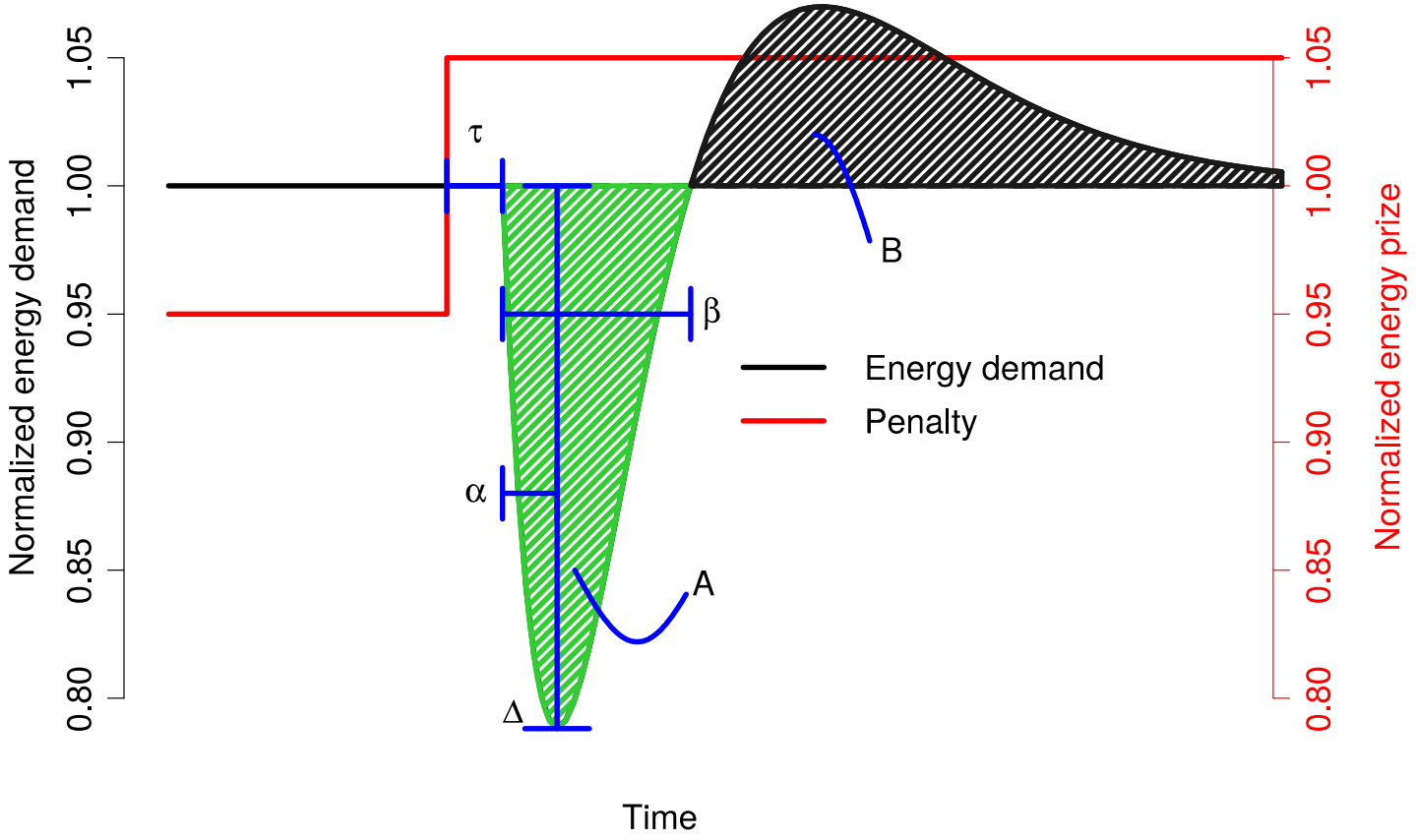
Flexibility Characteristics



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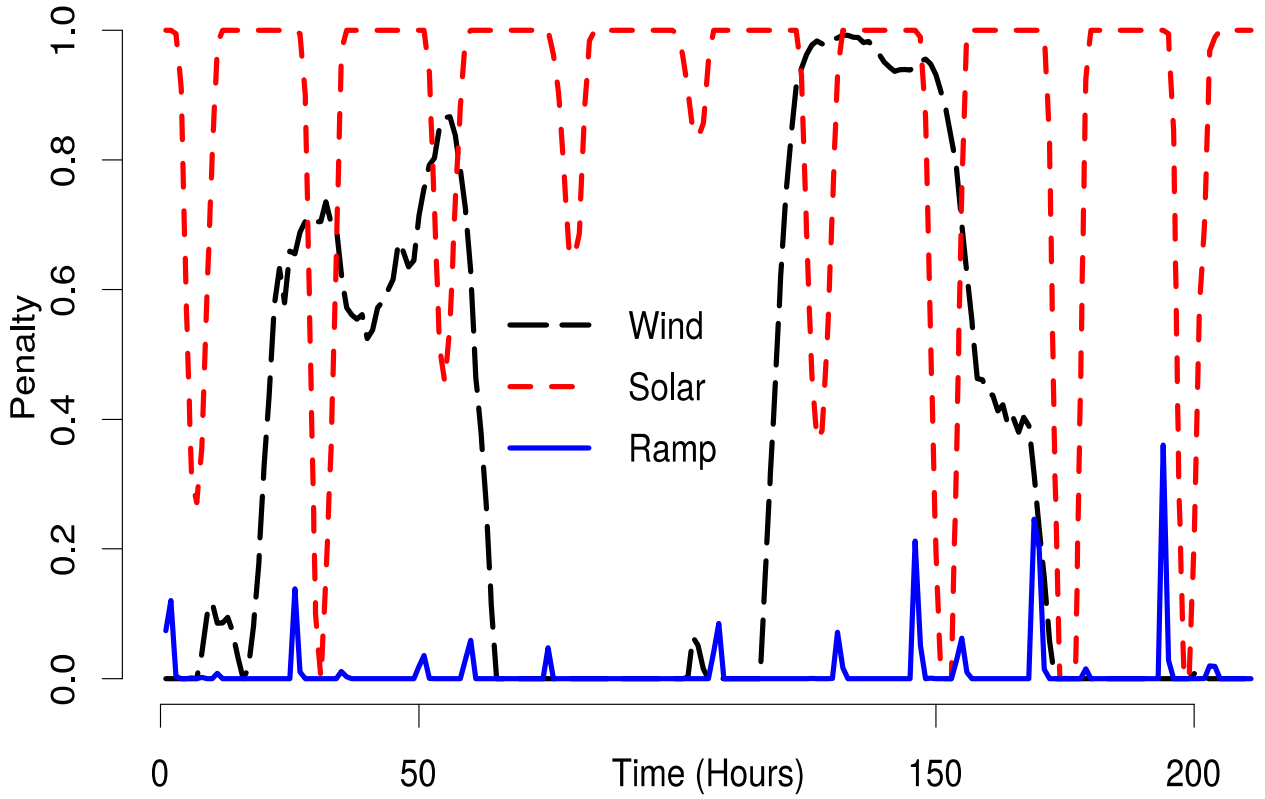
Examples of Penalty signals



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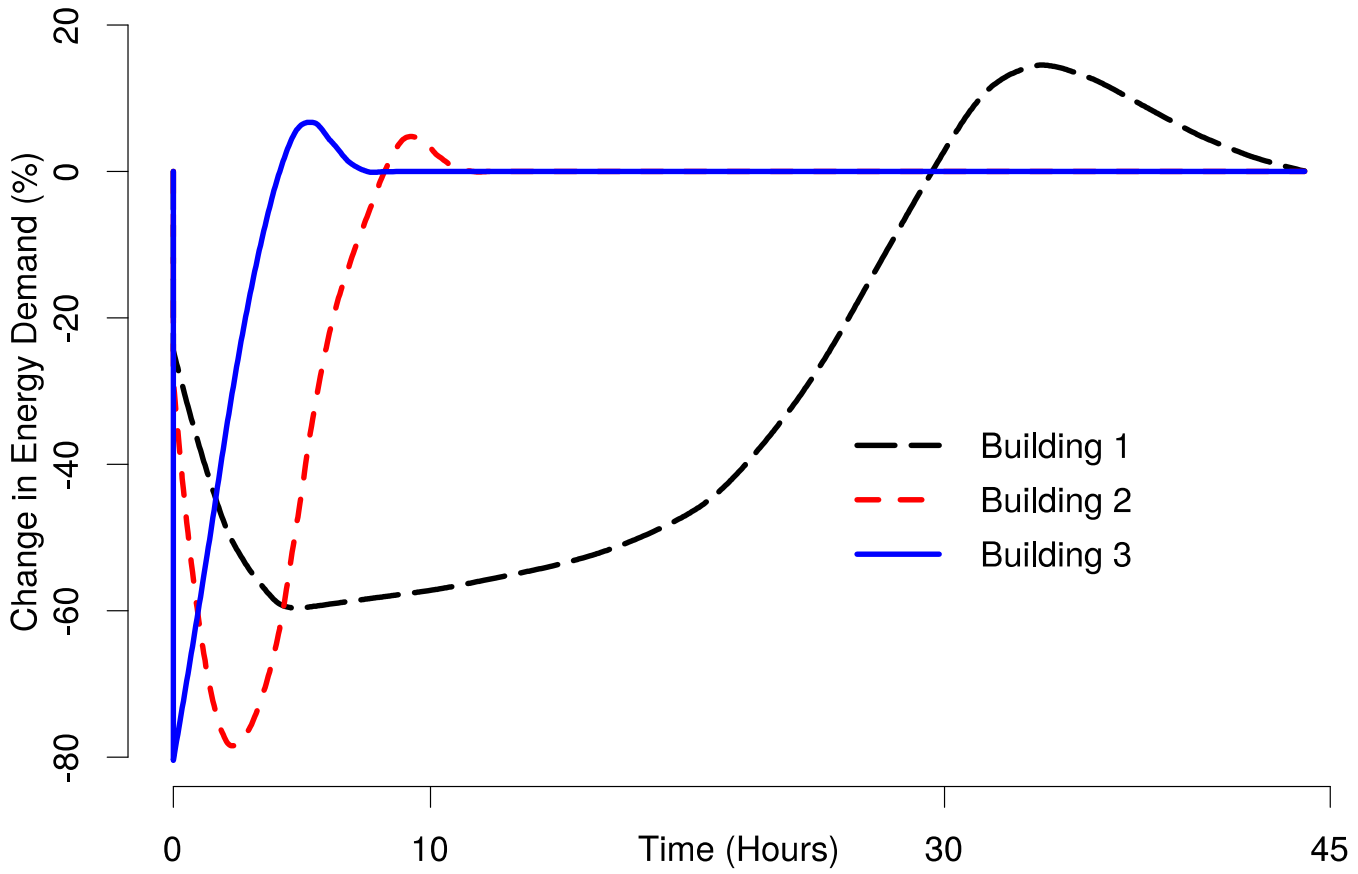
Examples of Flexibility Functions



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Performance-based Flexibility Index

$$FI_j^i = \int_0^T Y_j^i(t)U_i(t)dt \Big/ \int_0^T Y_j(t)U_i(t)dt$$

	Wind (%)	Solar (%)	Ramp (%)
Building 1	11.8	4.4	6.0
Building 2	3.6	14.5	10.0
Building 3	1.0	5.0	18.4

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Conclusions

- Energy flexibility depends on the problems
- The problems depend on time and location
- Different solutions for different problems

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