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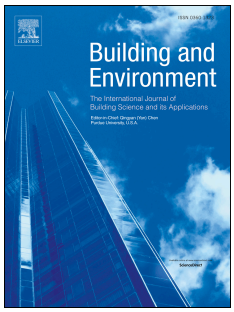

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Combining performance and implementability of model-based controllers for indoor climate control in office environments

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Nomenclature

c	CO_2 concentration [ppm]
c_p	specific heat capacity [J/(kg K)]
h	hour
$\dot{M}$	CO_2 flow rate [ml/s]
$\dot{Q}$	thermal power [W]
t	celsius temperature [°C]
u	information about thermal disturbances [W]
V	volume [m^3]
$\dot{V}$	volume flow rate [m^3/s]
y	controller output in supply quantities

Greek letters

ρ	density [kg/m^3]
τ	time [s]

Subscripts

act	activation
adj	adjacent
s	supply
r	room
w	water

[1]Abstract

Measures for an improved indoor climate control can potentially increase the energy efficiency in commercial buildings while comfort is maintained. Substantial energy reductions are possible by revising conventional building automation systems for an enhanced adaptation to process characteristics and current conditions. However, maintaining a low complexity to facilitate installation and commission of new technologies is also necessary to promote a widespread utilization. This work suggests a compromise between these two aspects by

Abbreviations
BAS (Building Automation System)
BFB (Benchmark Feed-Back controller)
CDF (Cumulative Distribution Function)
FCU (Fan-Coil Unit)
IAQ (Indoor Air Quality)
MBC (Model-Based Controller)
PMV (Predicted Mean Vote)
VAV (Variable Air Volume)

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