

IDA Indoor Climate and Energy

Modellgrenzen – Richtig Modellieren

Teil 1: Parametrierung und

building1 - IDA Indoor Climate and Energy

File Edit View Insert Tools Options Window Help

Properties Palette

building1: building1.idm

General Schematic Floor

Window

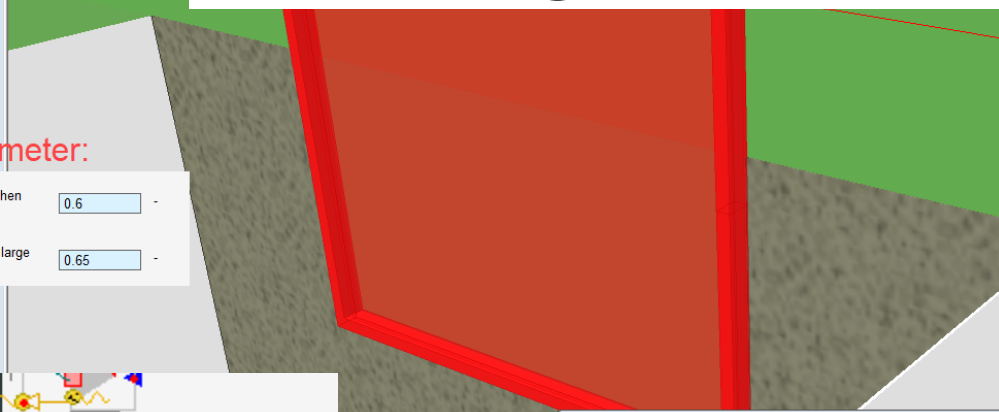
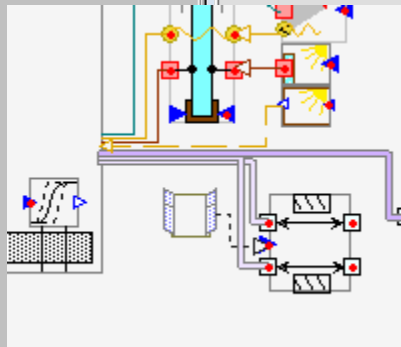
	Min	Max	Size [m]
x	0.6	1.85	1.25
y	0.8	2.0	1.2

Area 1.50 m²

Systemparameter:

Exponent in leak power law when ELA is given 0.6 -

Cd factor in flow(pressure) for large openings 0.65 -

OPENING-WIDTH

Öffnung vs. Undichte

Leak 1: a leak in building1.Zone.Wall 3

General Outline Annotations

Leak

Pressure driven flow

Leak area at 4 Pa n.a. m²

Powerlaw coef. 0.0 kg/(s·Paⁿ)

Powerlaw exponent 0.5

Pressure coefficients [Add](#)

Given (pressure independent) flow

Flow n.a. L/s [Positive direction from this zone]

Schedule n.a.

n building1.Zone.Wall 3

Annotations

[Default] 3 pane glazing, clear, 4-12-4-12-4

Integrated Window Shading

Device [Default] © No integrated shading

Control Sun

Schedule n.a.

External Window Shading

Type No external shading

Model n.a.

Control n.a.

Schedule n.a.

Recess depth 0 m

Opening [More...](#)

Control OpeningCtrlMacro

Schedule © Never open

Frame

Fraction of the total window area 0.1

U-value 2.0

Window

Opening

Max relative width 60 %

Max relative height 100 %

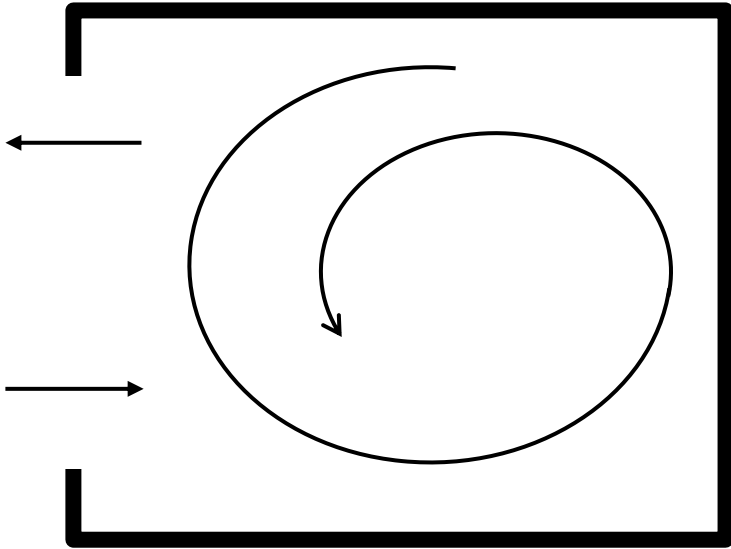
Cd factor in flow(pressure) 0.65 -

Pressure coefficients [Add](#)

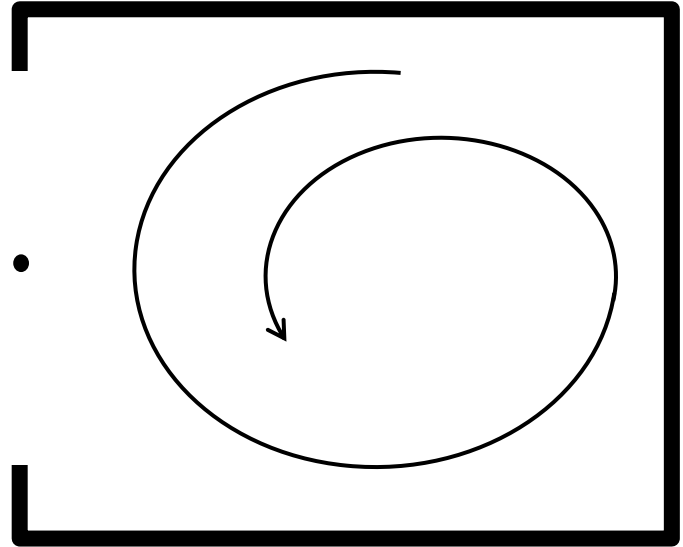
OK Cancel Help

Öffnung vs. Undichte

Grosse Öffnung

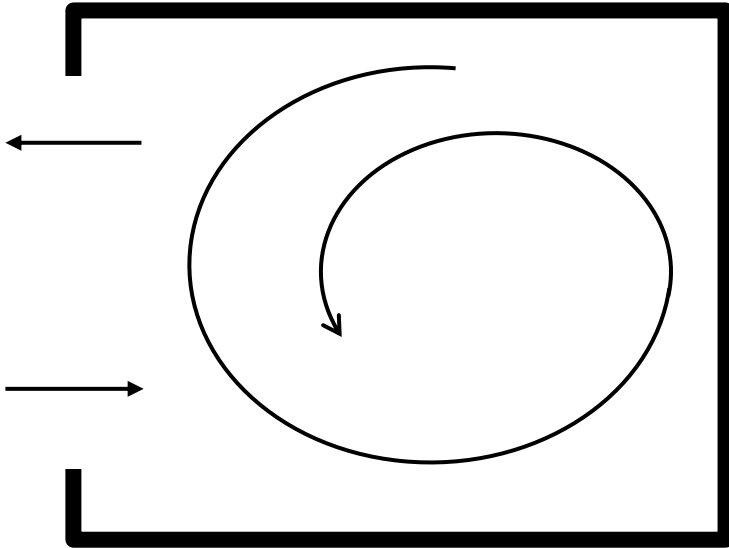


«Grosse» Undichte

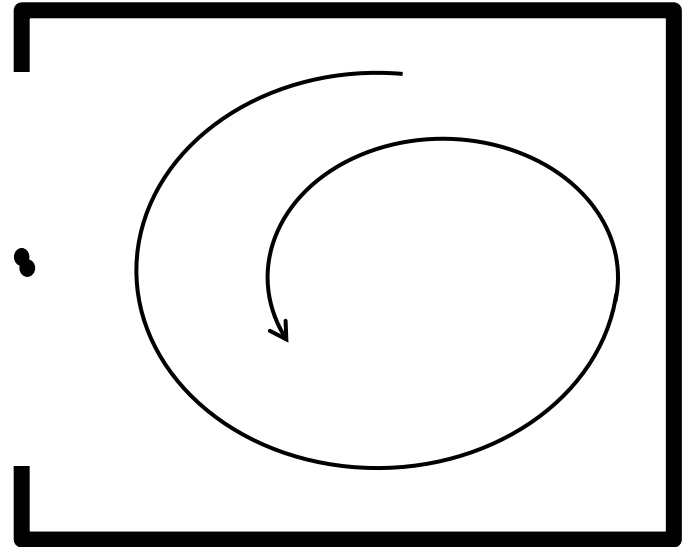


Öffnung vs. Undichte

Grosse Öffnung

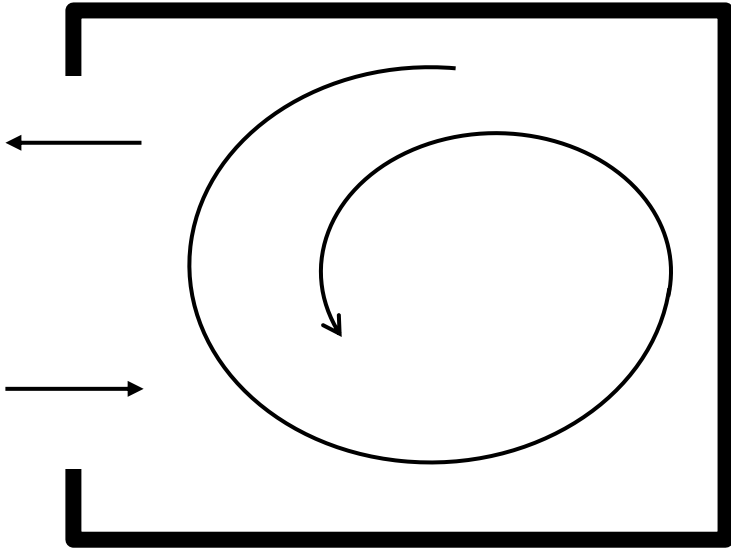


2 Undichten auf gleicher Höhe

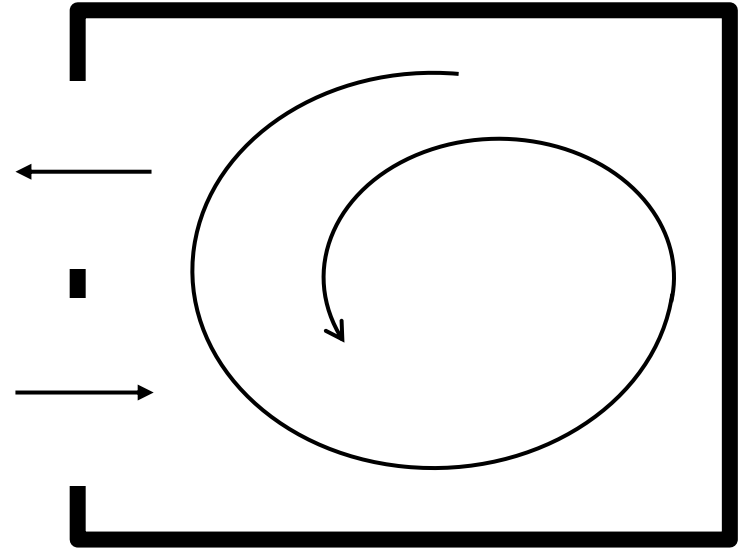


Öffnung vs. Undichte

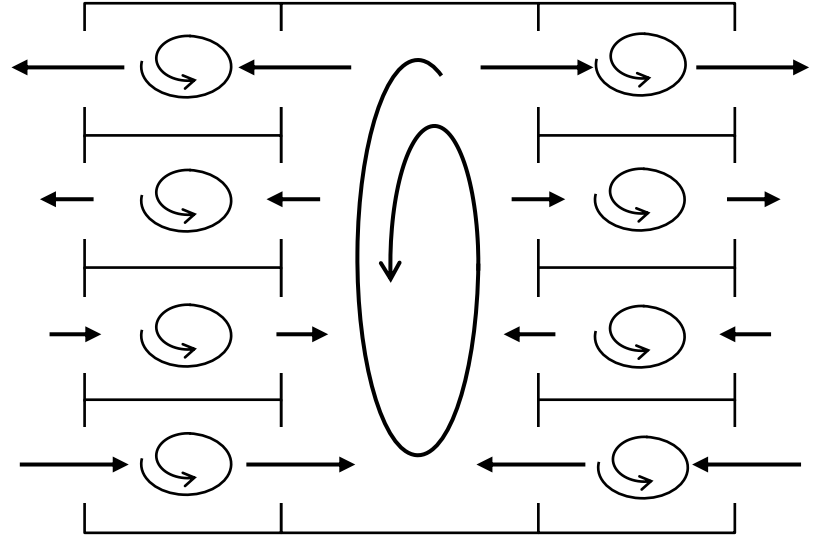
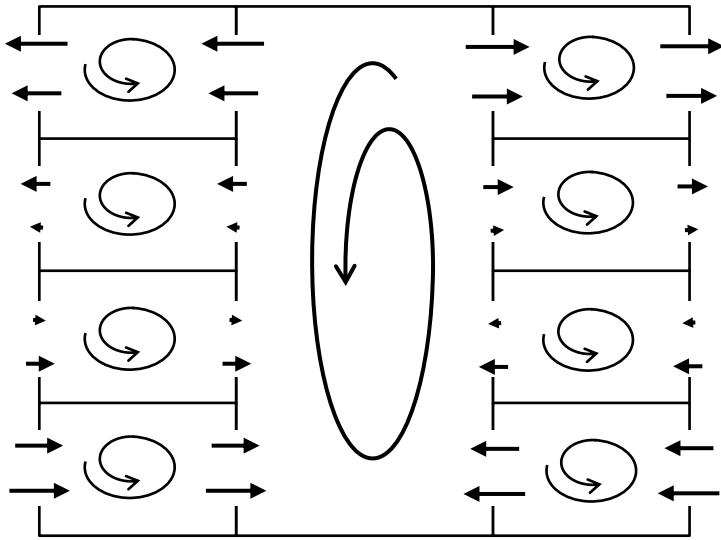
Grosse Öffnung



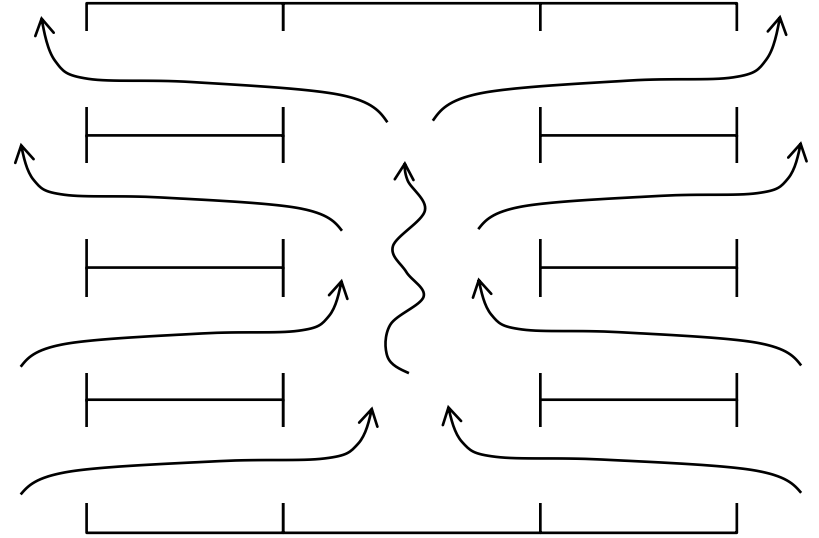
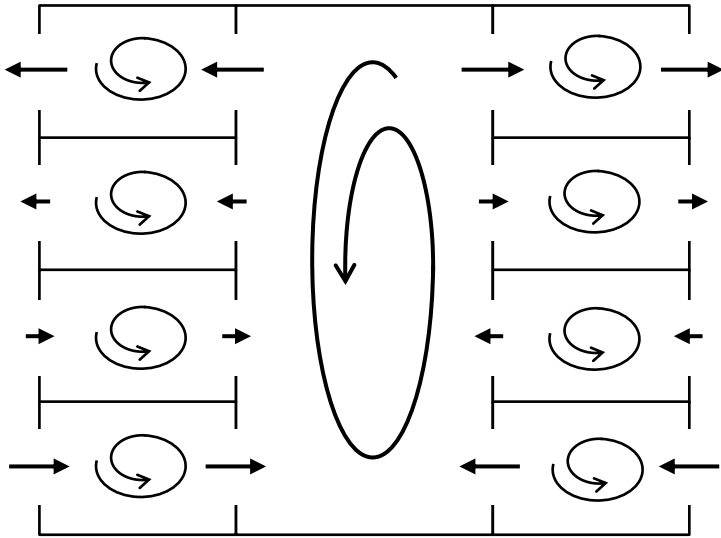
2 Undichten auf versch. Höhe

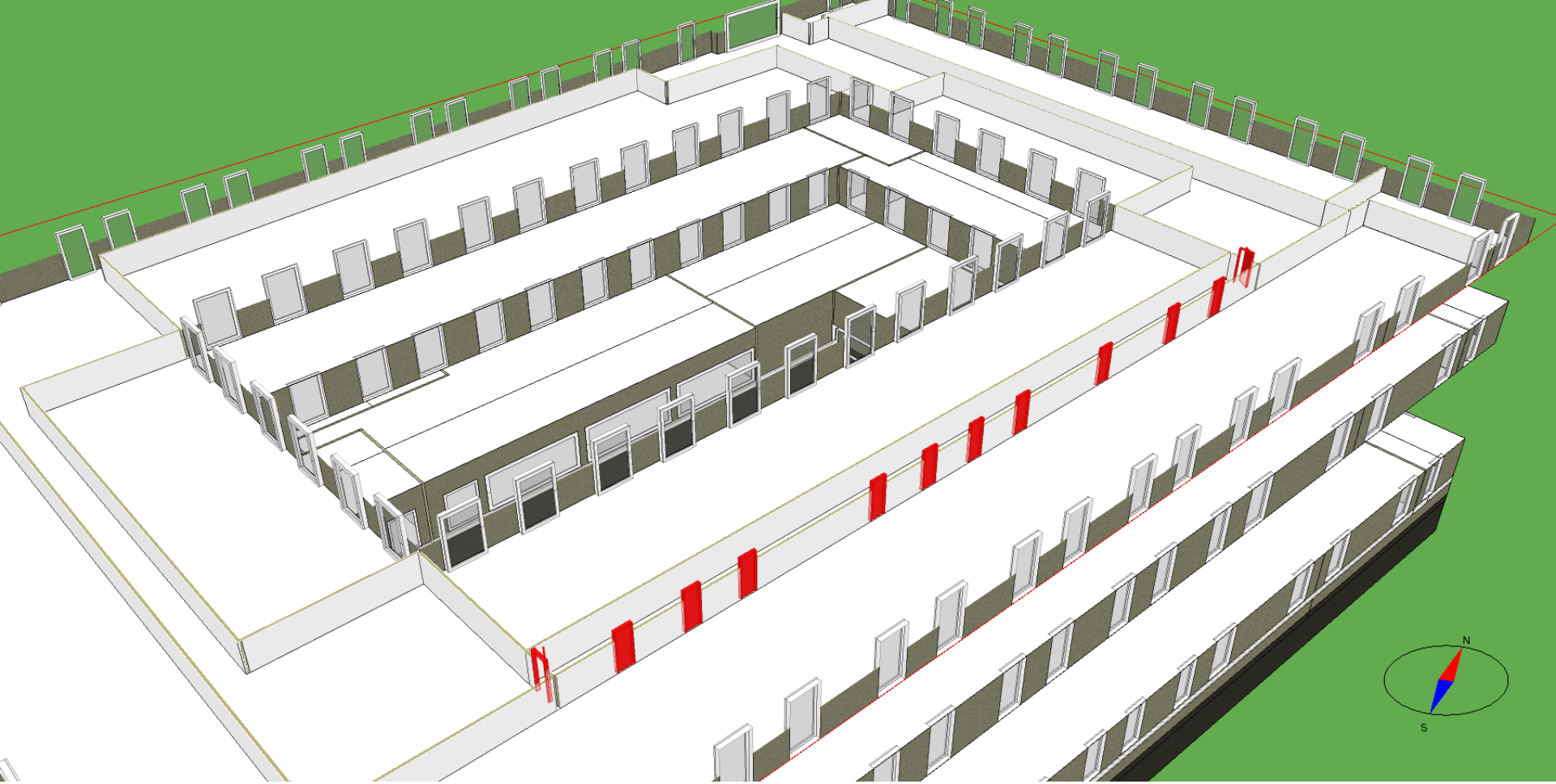


Öffnung vs. Undichte



Zonen = Knoten

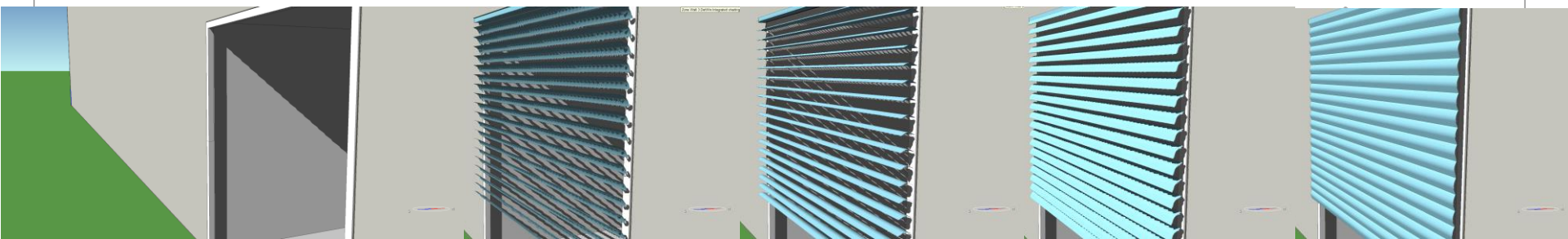
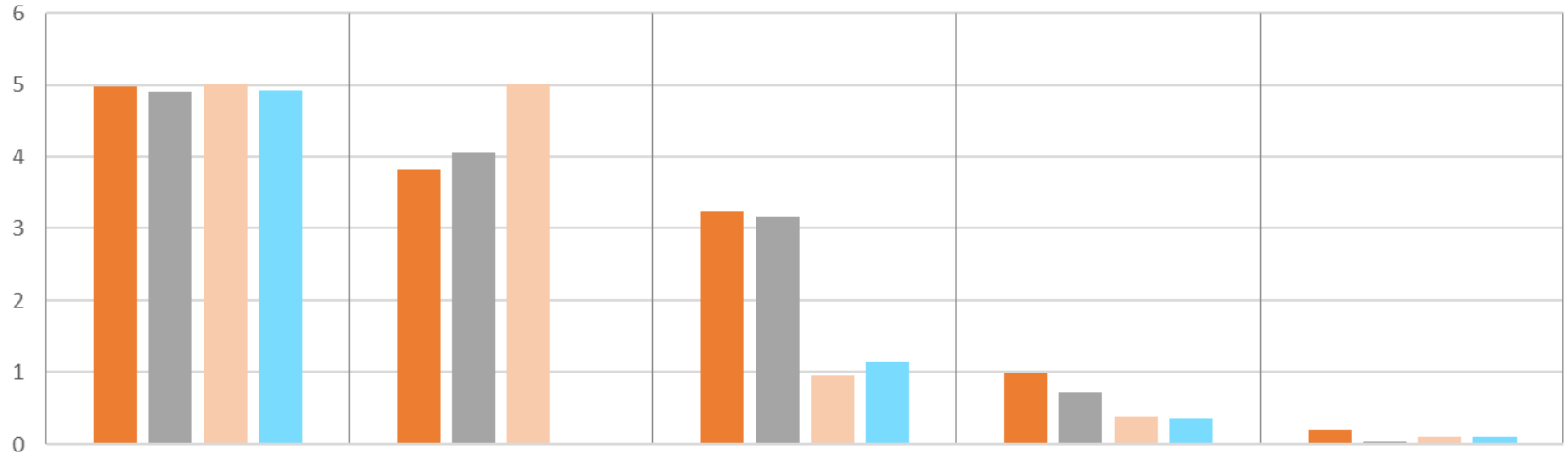




Natürliche Schulhauslüftung über Gang



Solarer Eintrag [kW] - Lamellenstoren



■ Referenz IDA ICE ■ Referenz E+ ■ IDA ICE - einfaches Fenstermodell ■ TAS

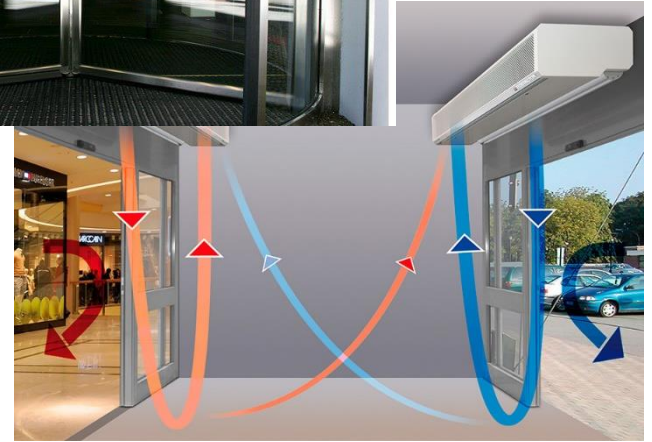
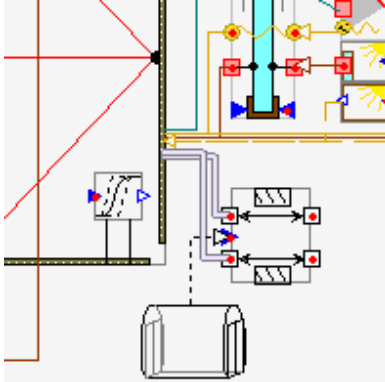
Glas-Aussenoberflächentemp.



Nicht-Standard-Gebäude



Türen und Tore

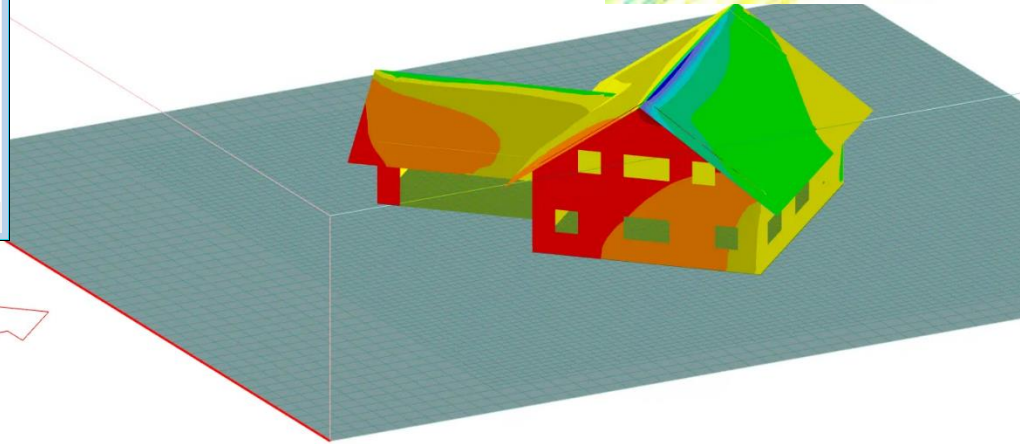
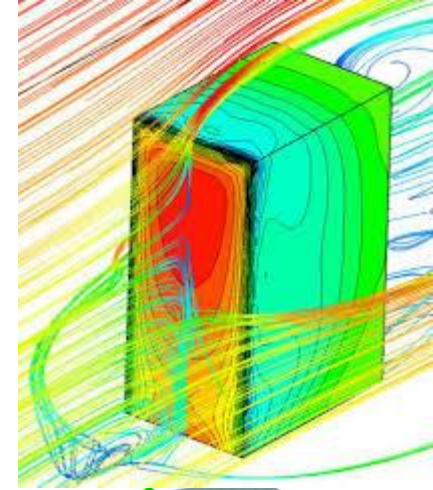


Winddruckkoeffizienten

134Turicum_HotelTABSAndFancoil: C:\Users\svnm\OneDrive\Desktop\134Turicum_HotelTABSAndFancoil.idm (Pressure-Coeff...)

Face \ Angle	0	45	90	135	180	225	270	315	Face azi...
Gebäudevolumen									
f1a	0.4	0.2	-0.6	-0.5	-0.3	-0.5	-0.6	0.2	122.7
f1b	0.4	0.1	-0.3	-0.35	-0.2	-0.35	-0.3	0.1	212.7
f1c	0.25	0.06	-0.35	-0.6	-0.5	-0.6	-0.35	0.06	122.7
f1d	0.4	0.1	-0.3	-0.35	-0.2	-0.35	-0.3	0.1	32.7
f1e	0.4	0.2	-0.6	-0.5	-0.3	-0.5	-0.6	0.2	122.7
f2	0.25	0.06	-0.35	-0.6	-0.5	-0.6	-0.35	0.06	212.7
f3a	0.25	0.06	-0.35	-0.6	-0.5	-0.6	-0.35	0.06	299.8
f3b	0.4	0.2	-0.6	-0.5	-0.3	-0.5	-0.6	0.2	32.7
f3c	0.4	0.2	-0.6	-0.5	-0.3	-0.5	-0.6	0.2	302.7
f3d	0.4	0.2	-0.6	-0.5	-0.3	-0.5	-0.6	0.2	212.7
f3e	0.4	0.2	-0.6	-0.5	-0.3	-0.5	-0.6	0.2	299.8
f4	0.25	0.06	-0.35	-0.6	-0.5	-0.6	-0.35	0.06	32.7
Crawl space	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	122.7
Roof	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	122.7
Volumen 1									
Crawl space	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	122.7
Roof	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	122.7
f1	0.25	0.06	-0.35	-0.6	-0.5	-0.6	-0.35	0.06	122.7
f2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	212.7

Auto fill



Hinterlüftete Fassaden



Verschattung opaker Bauteile



Erdberührte Bauteile



Schachträume



Grüne Dächer und Fassaden

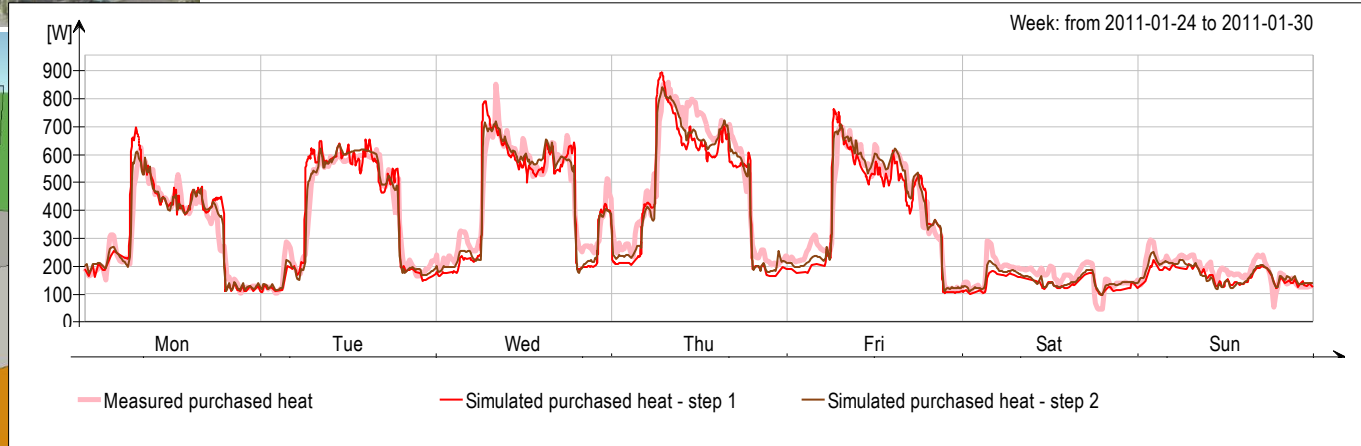


IDA Indoor Climate and Energy

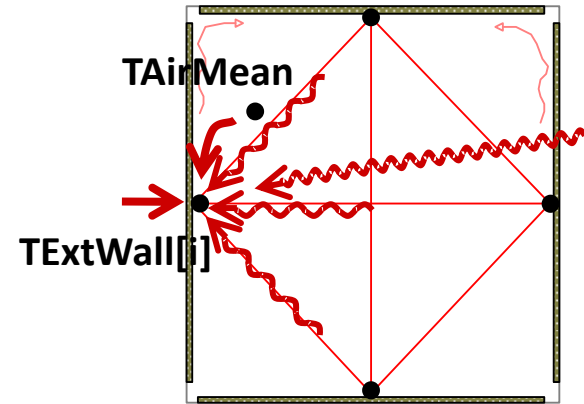
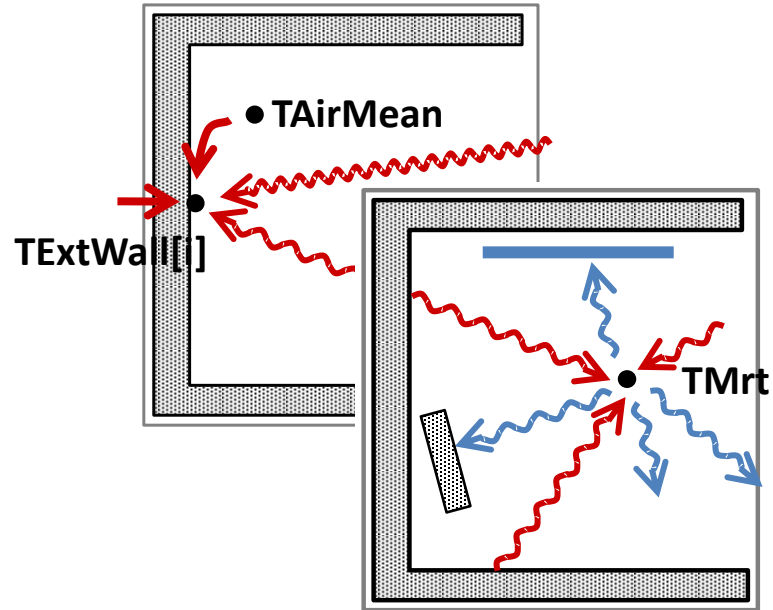
Modellgrenzen – Richtig Modellieren

Teil 2: Die Zonenmodelle

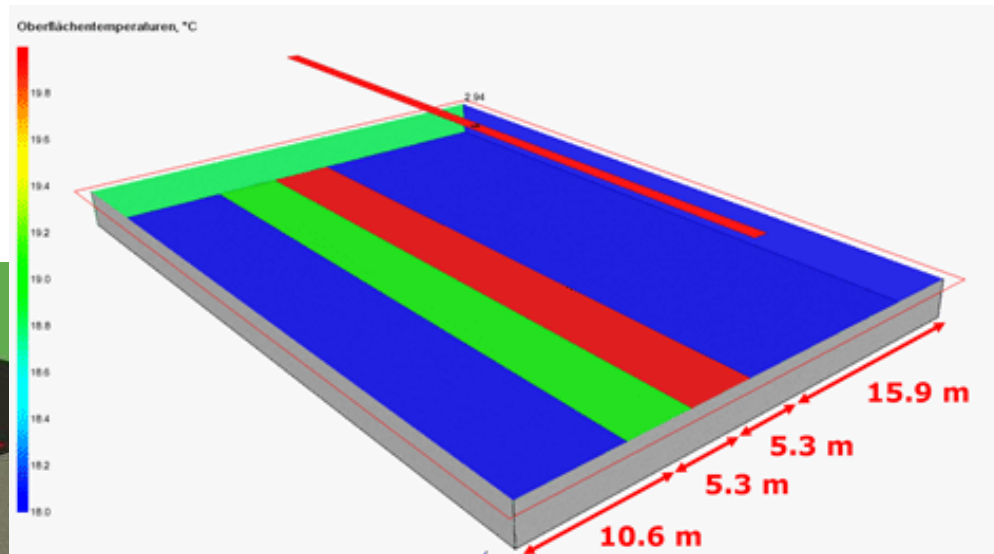
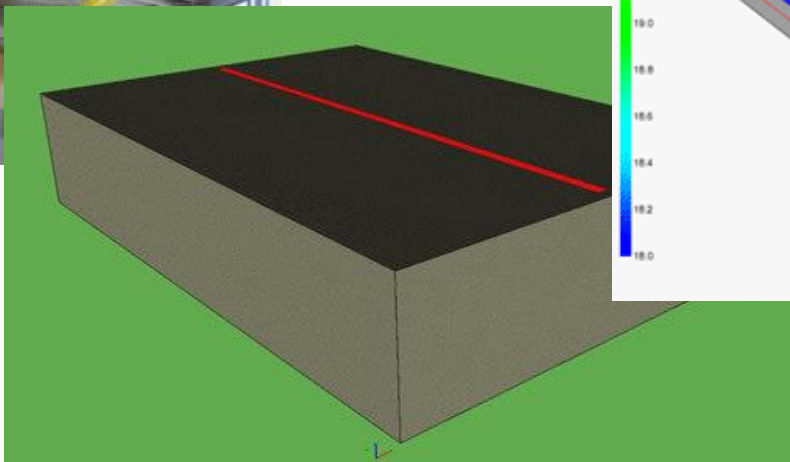
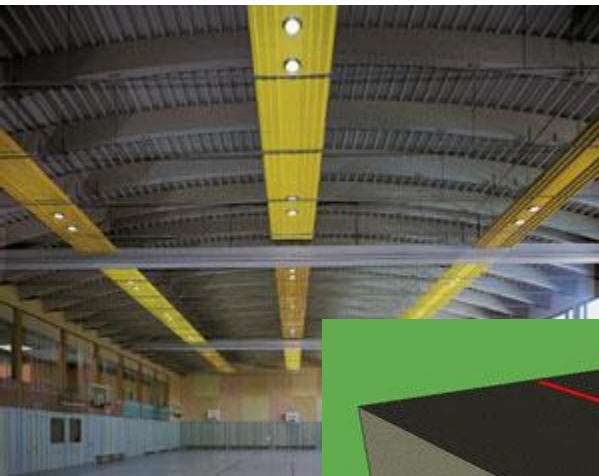
Anzahl Zonen



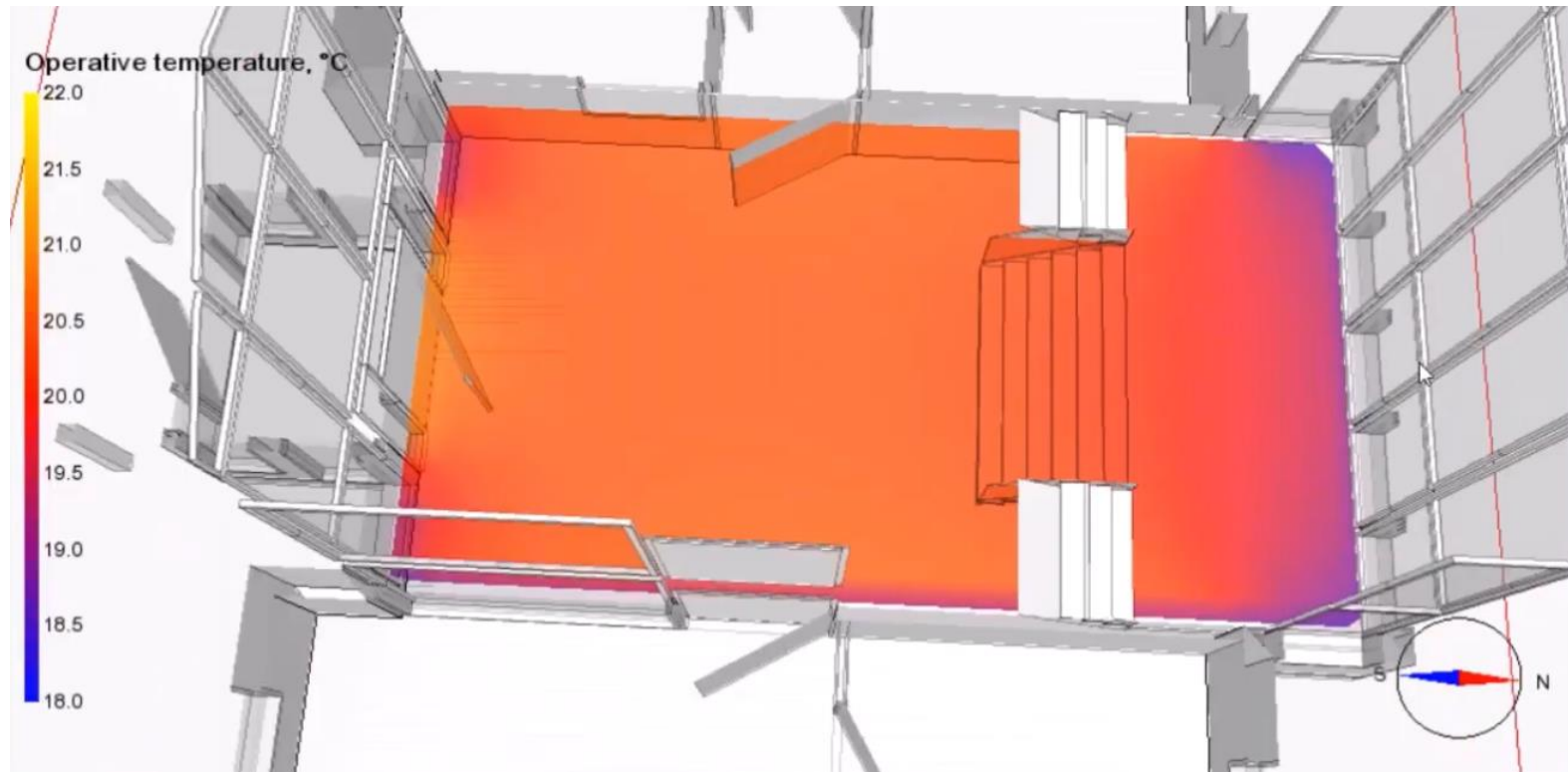
Einfaches vs. detailliertes Zonenmodell



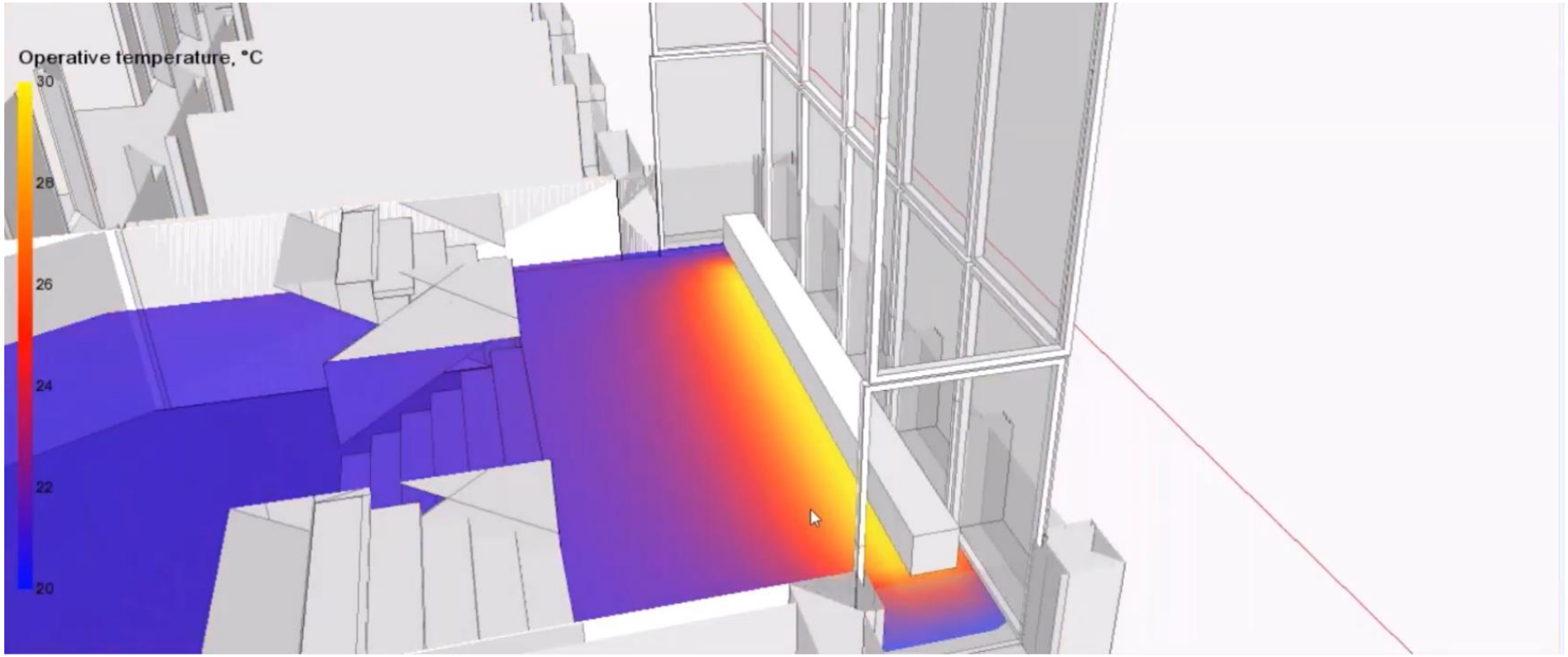
Temperaturstrahlung



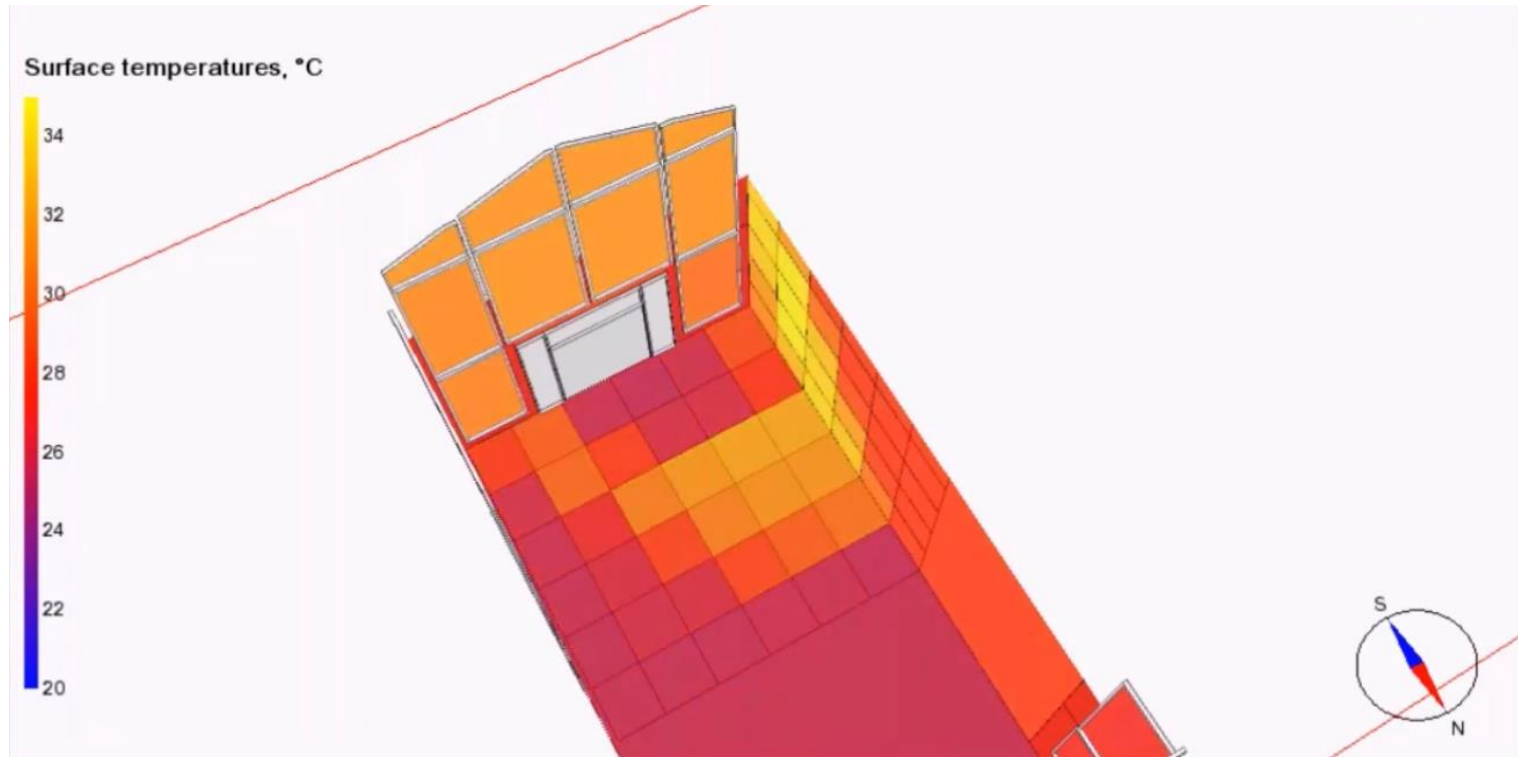
Operative Temperatures auf Messebene



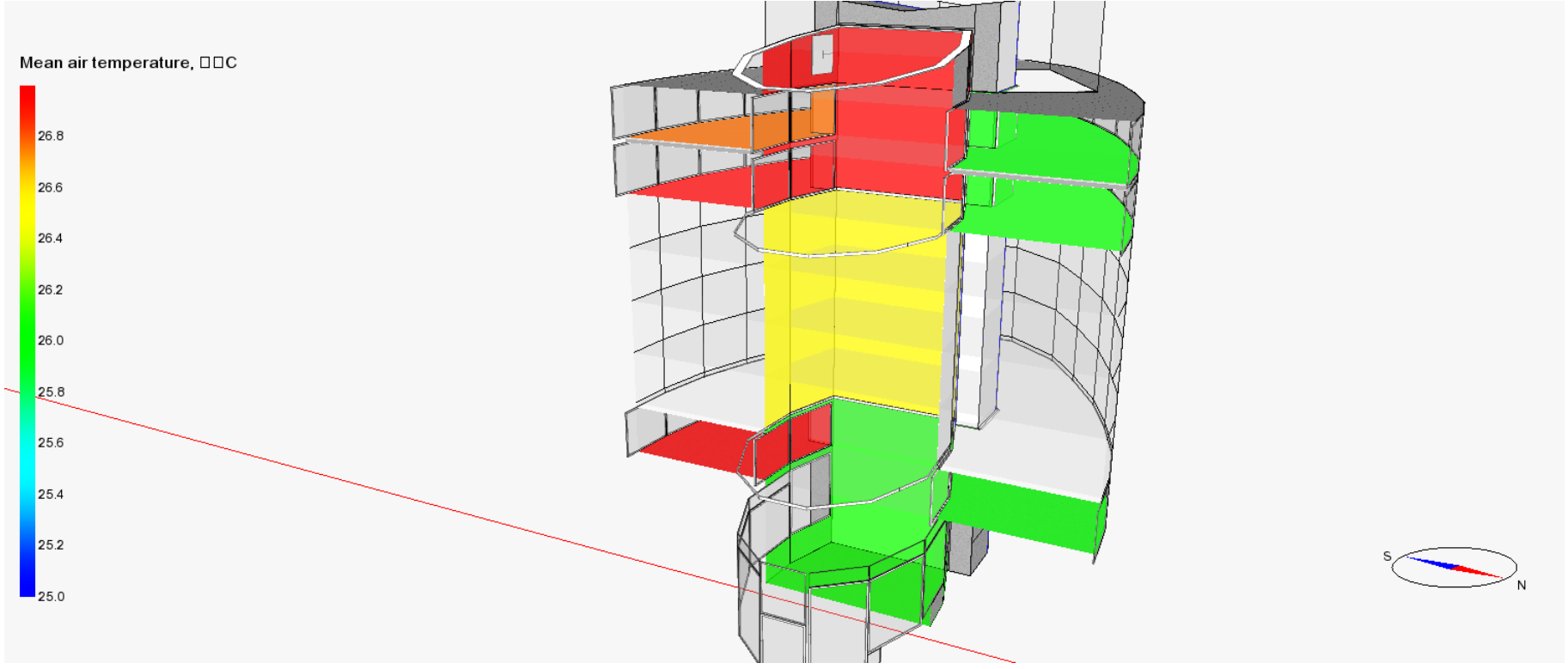
Operative Temperatures auf Messebene



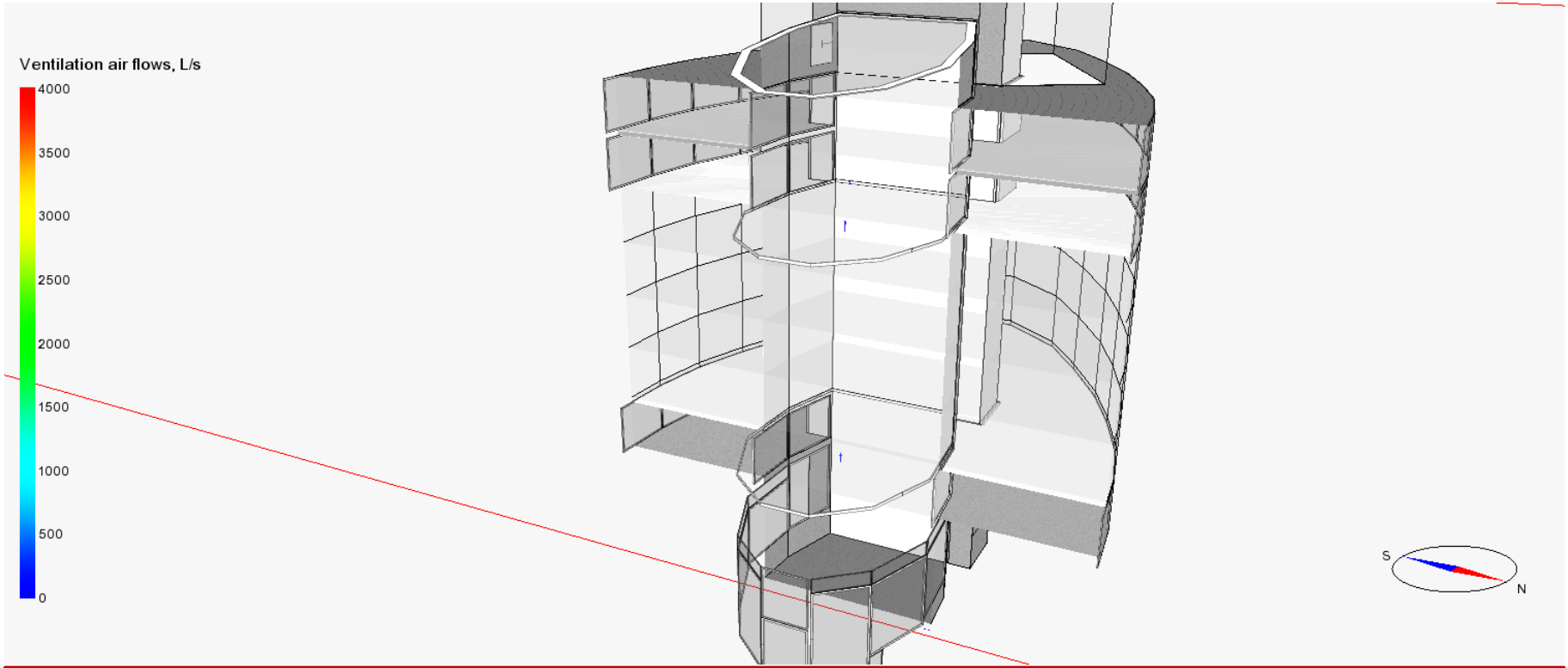
Oberflächentemperaturen



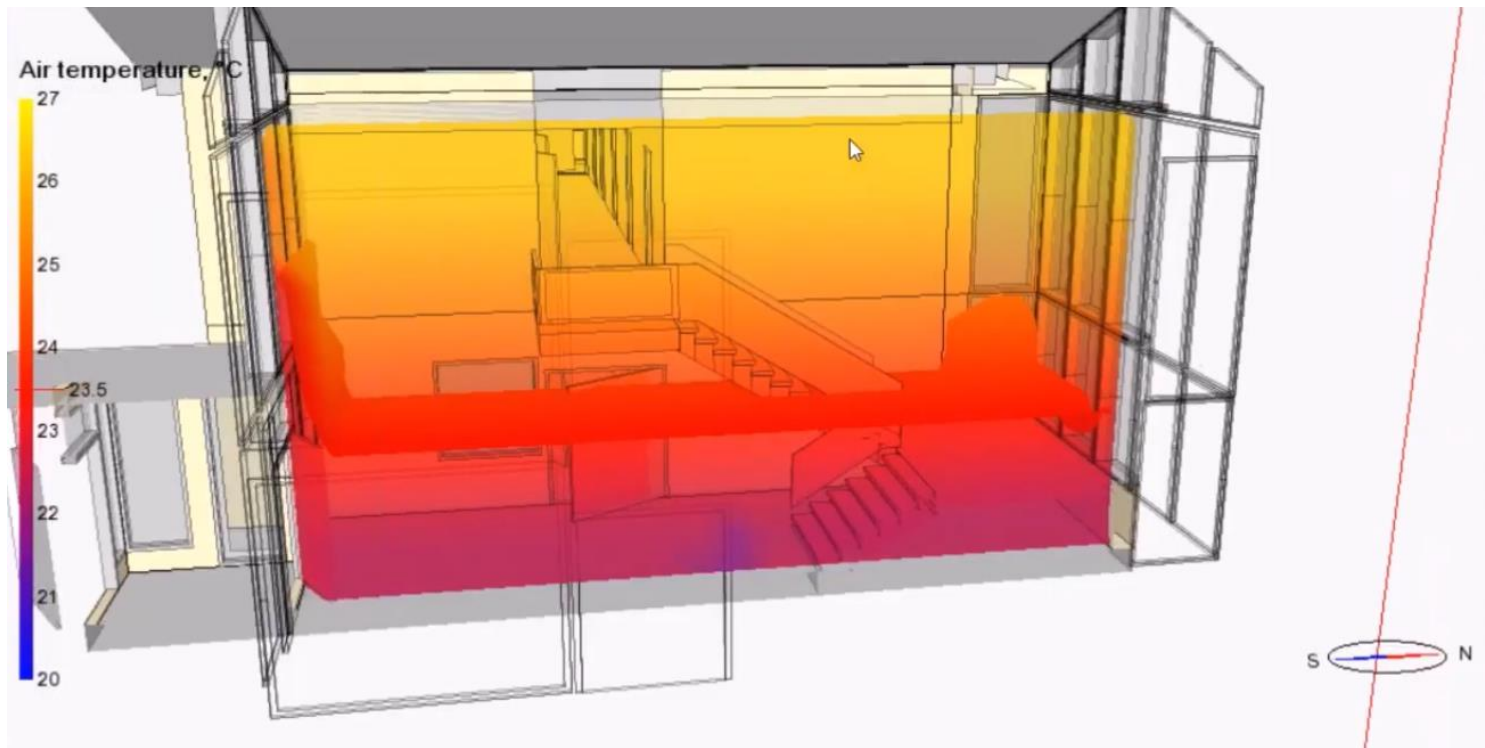
Gestapelte Zonen



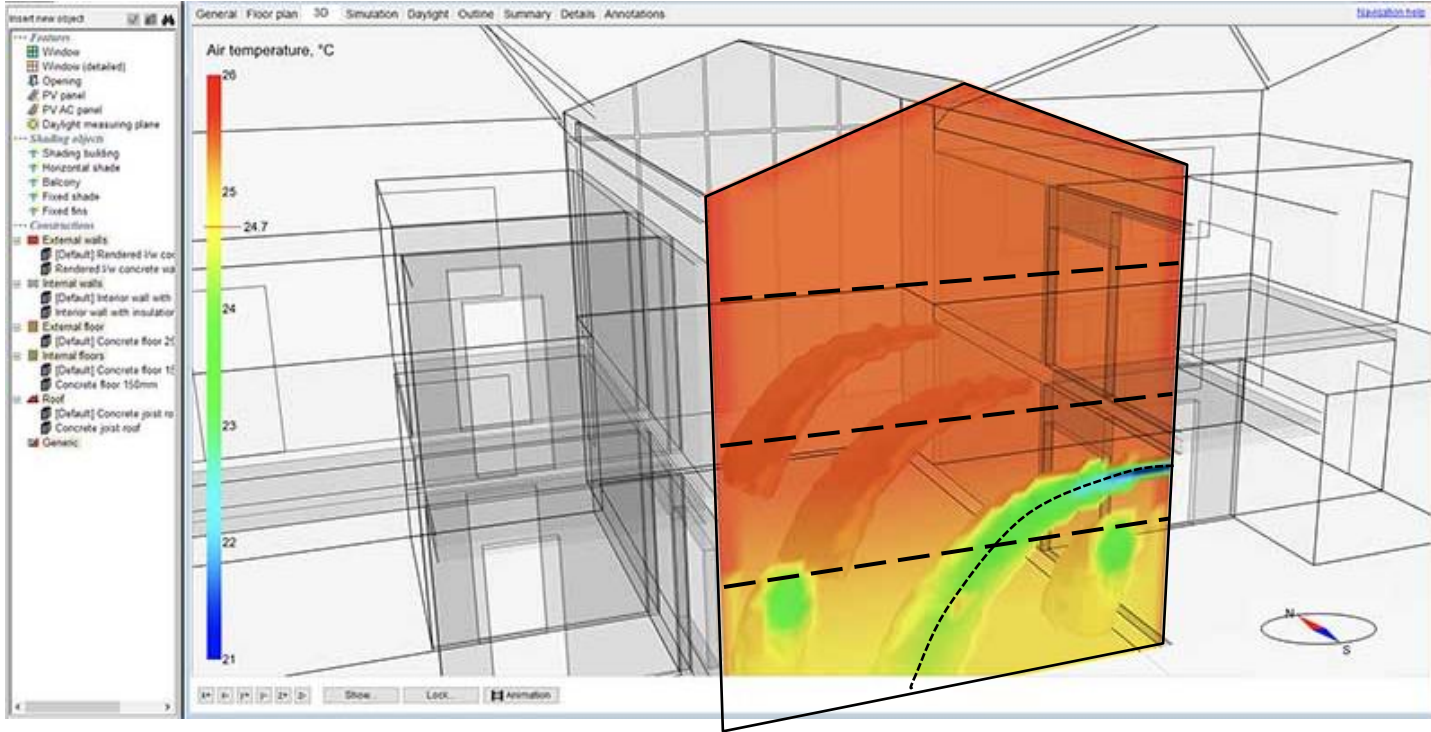
Gestapelte Zonen



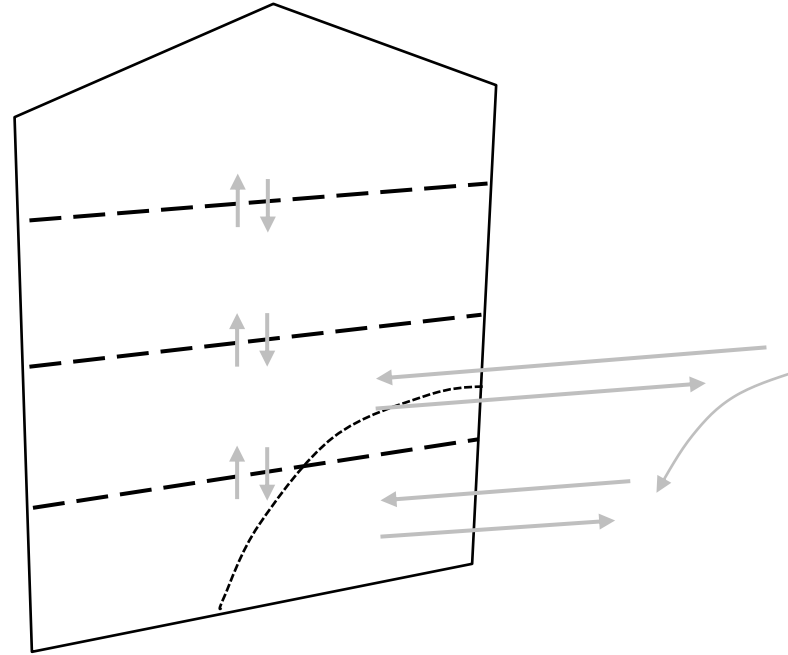
Geschichtete Zone



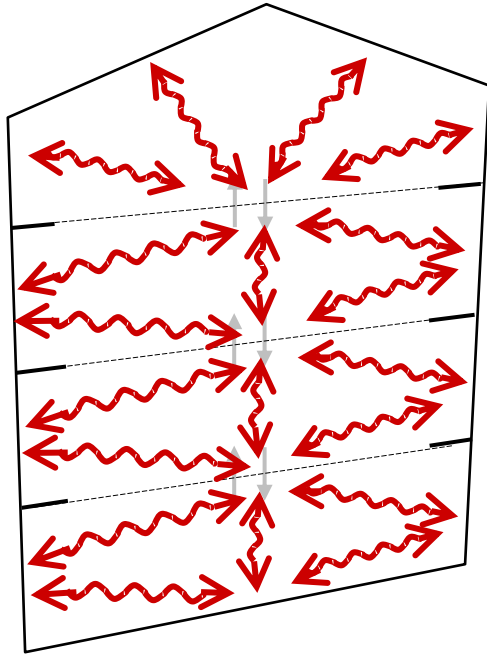
Geschichtete Zone mit Strömungselementen



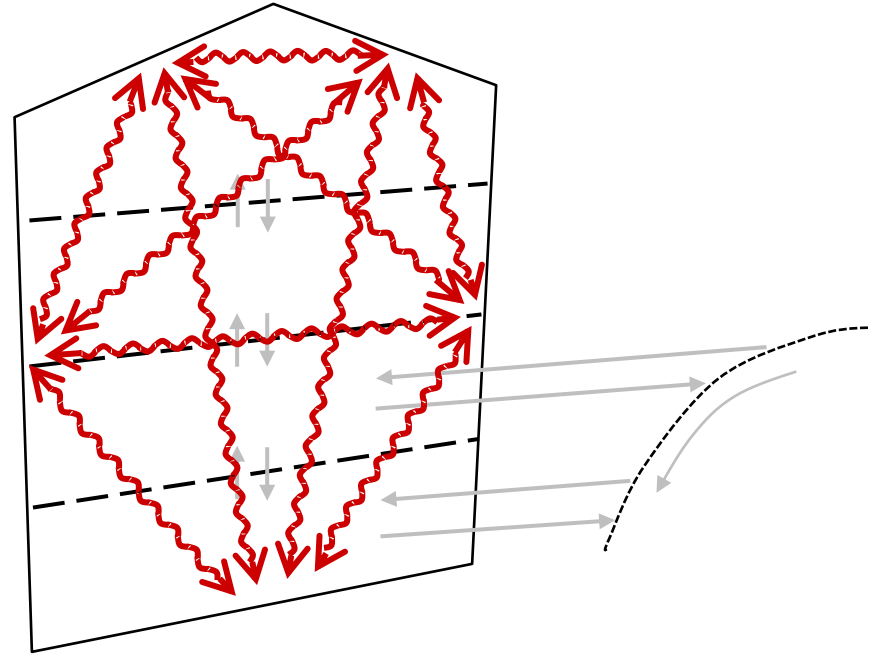
Geschichtete Zone mit Strömungselementen



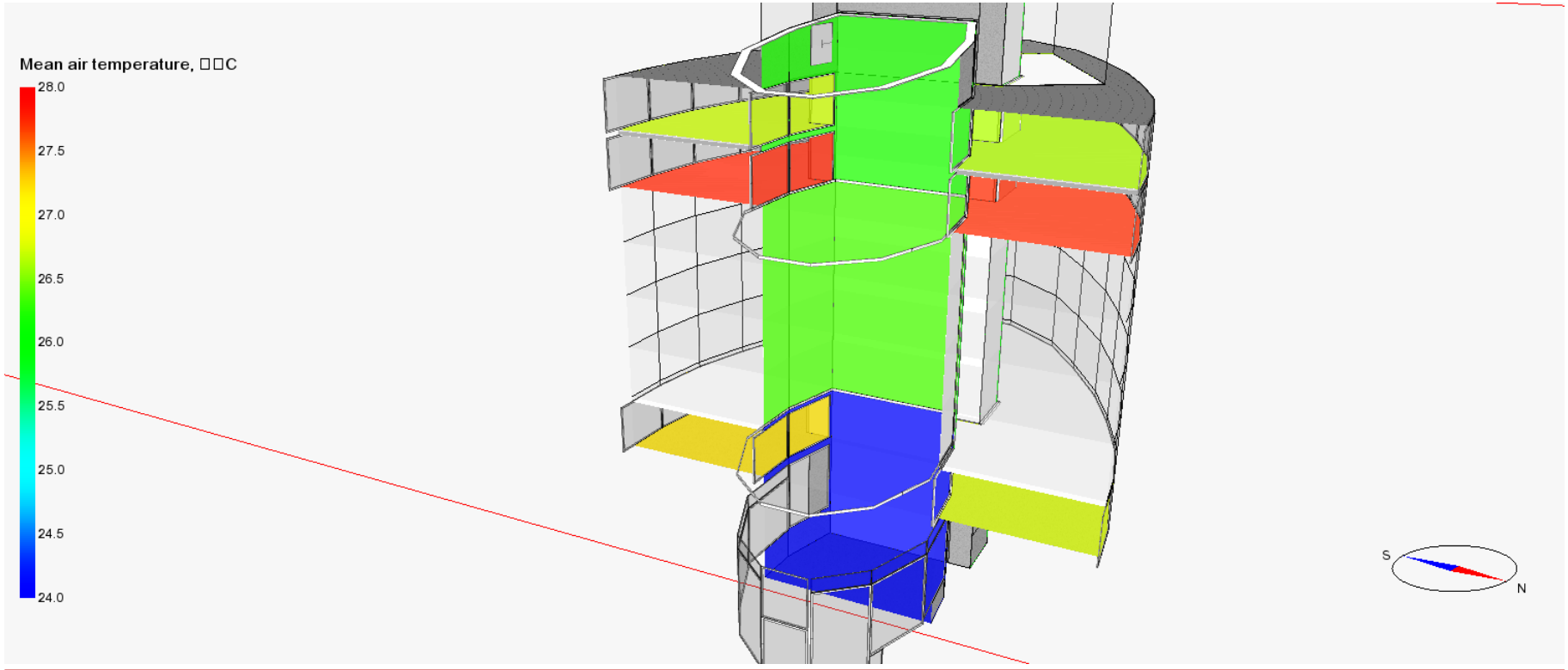
Gestapelte Zonen



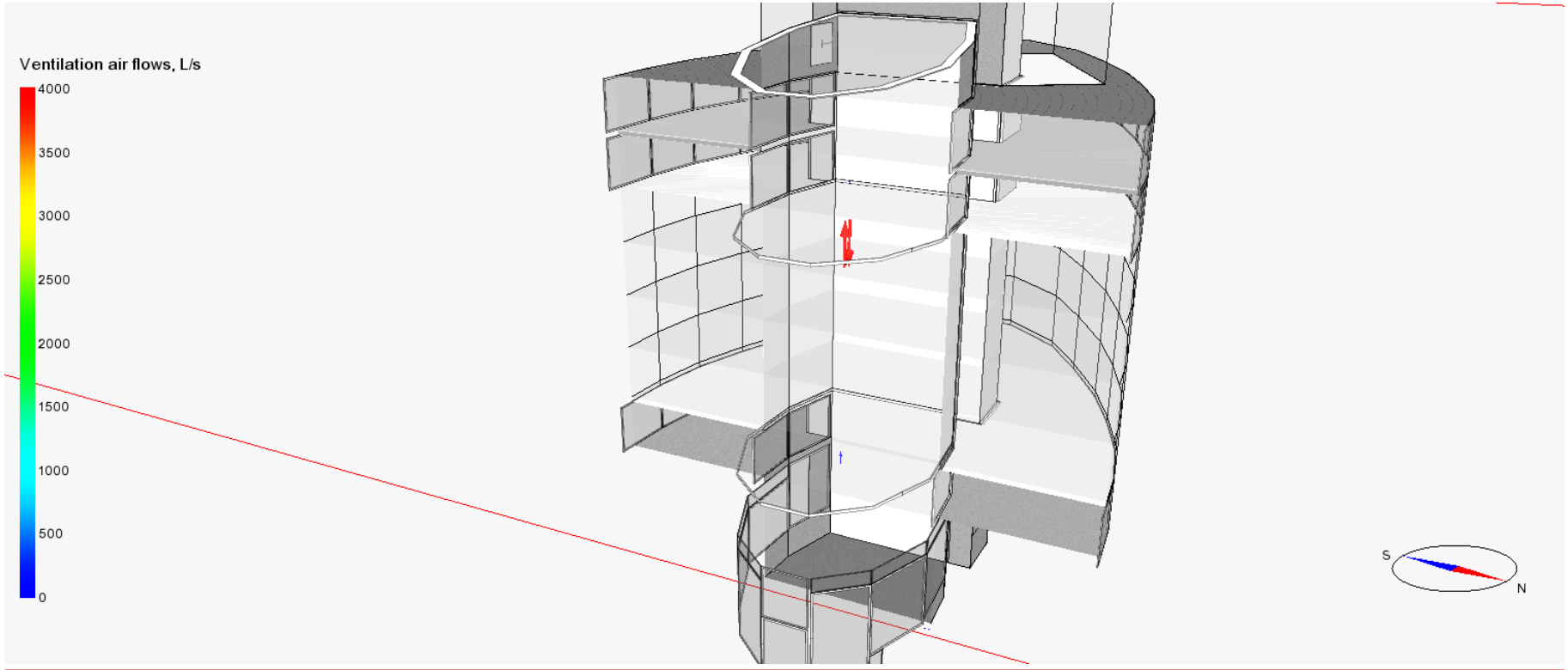
Geschichtete Zone mit Strömungselementen



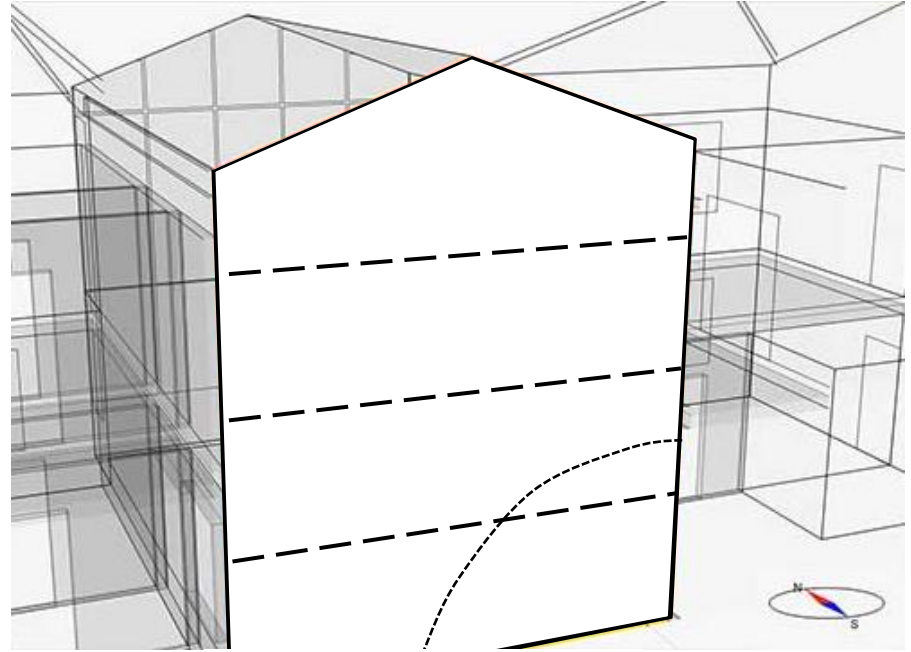
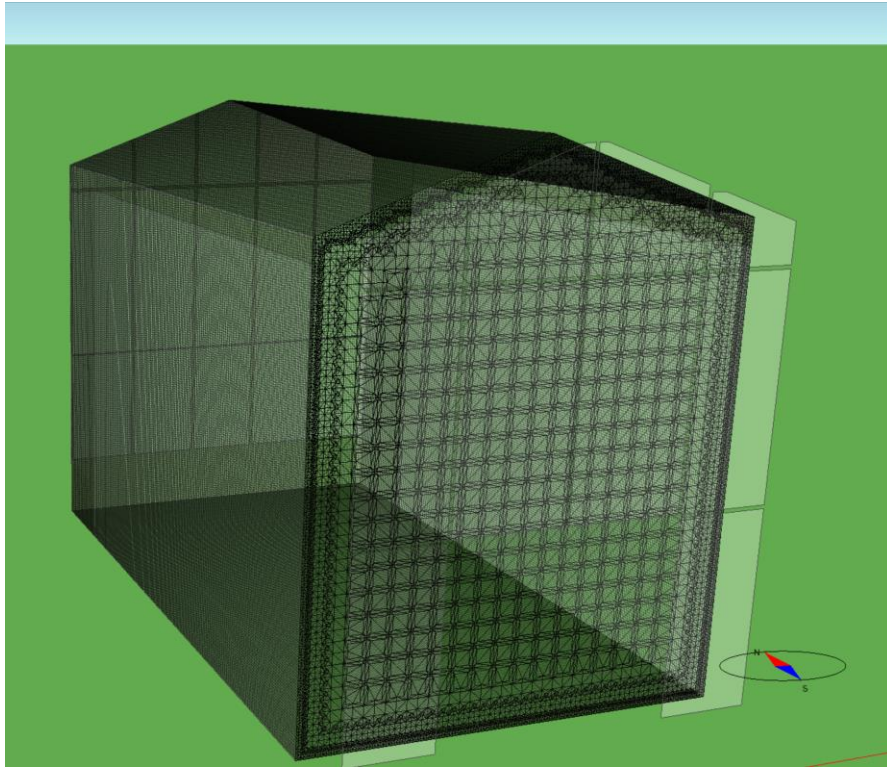
Gestapelte Zonen



Gestapelte Zonen



CFD vs. Geschichtete Zone

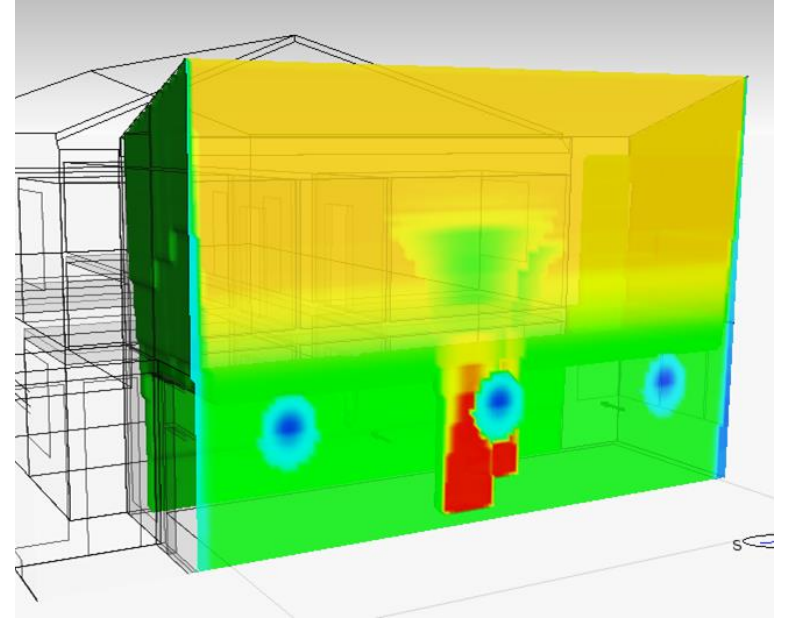
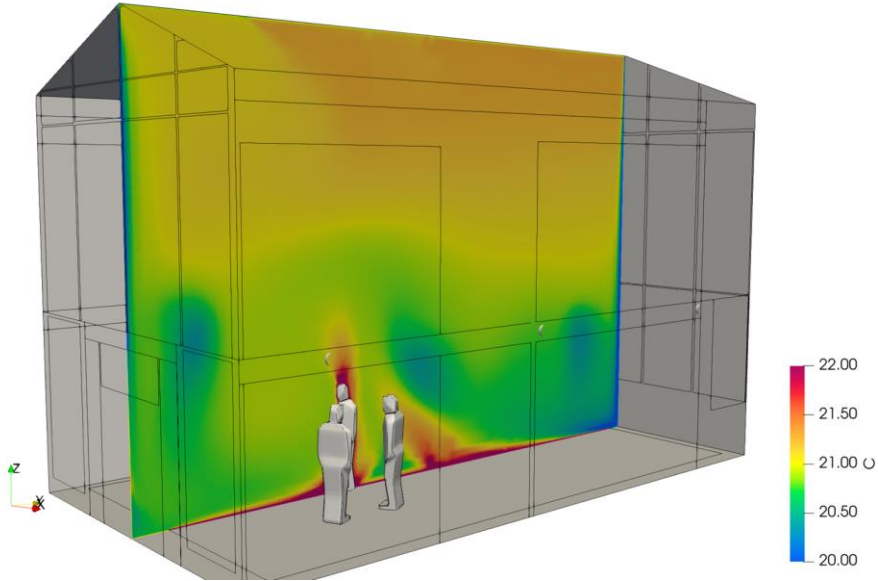


CFD vs. Geschichtete Zone

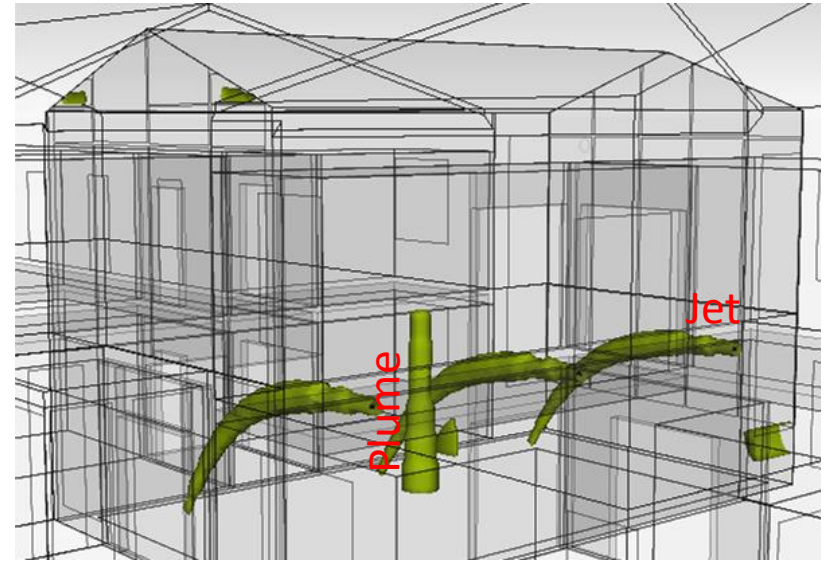
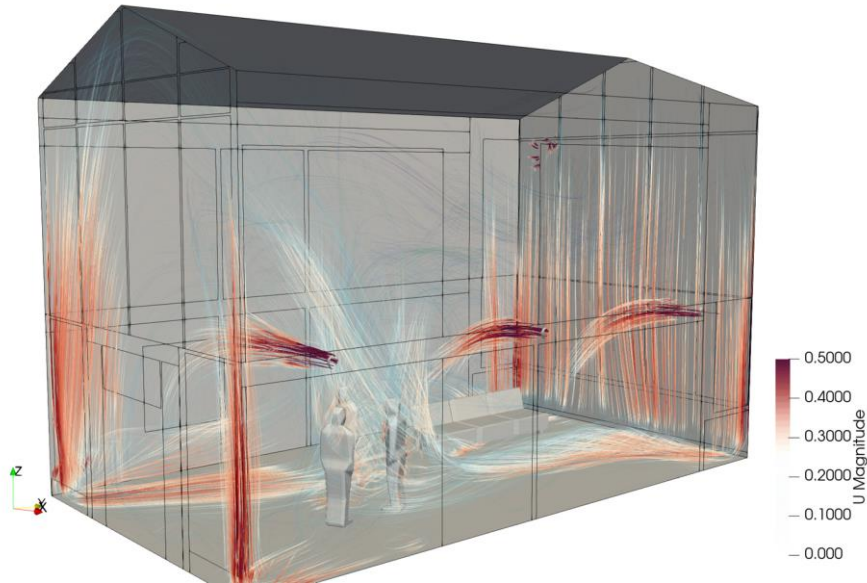
Statisch	• Dynamisch
Objekte im Raum	• «Leere» Zone
Detaillierter Lüftungs-Auslass-Typ	• Position, Fläche, Richtung
Vollständige Simulation aller Strömungseffekte	• Analytische Lösung von gewissen <u>isolierten</u> Strömungselementen

- Mit CFD können das geschichtete Zonenmodell oder Öffnungen zwischen Zonen validiert und deren Parameter kalibriert werden.
- Beides ist verbunden über die Randbedingungen der CFD-Simulation, welche aus der IDA ICE Simulation bestimmt werden

CFD vs. Geschichtete Zone



CFD vs. Geschichtete Zone



CFD vs. Geschichtete Zone

