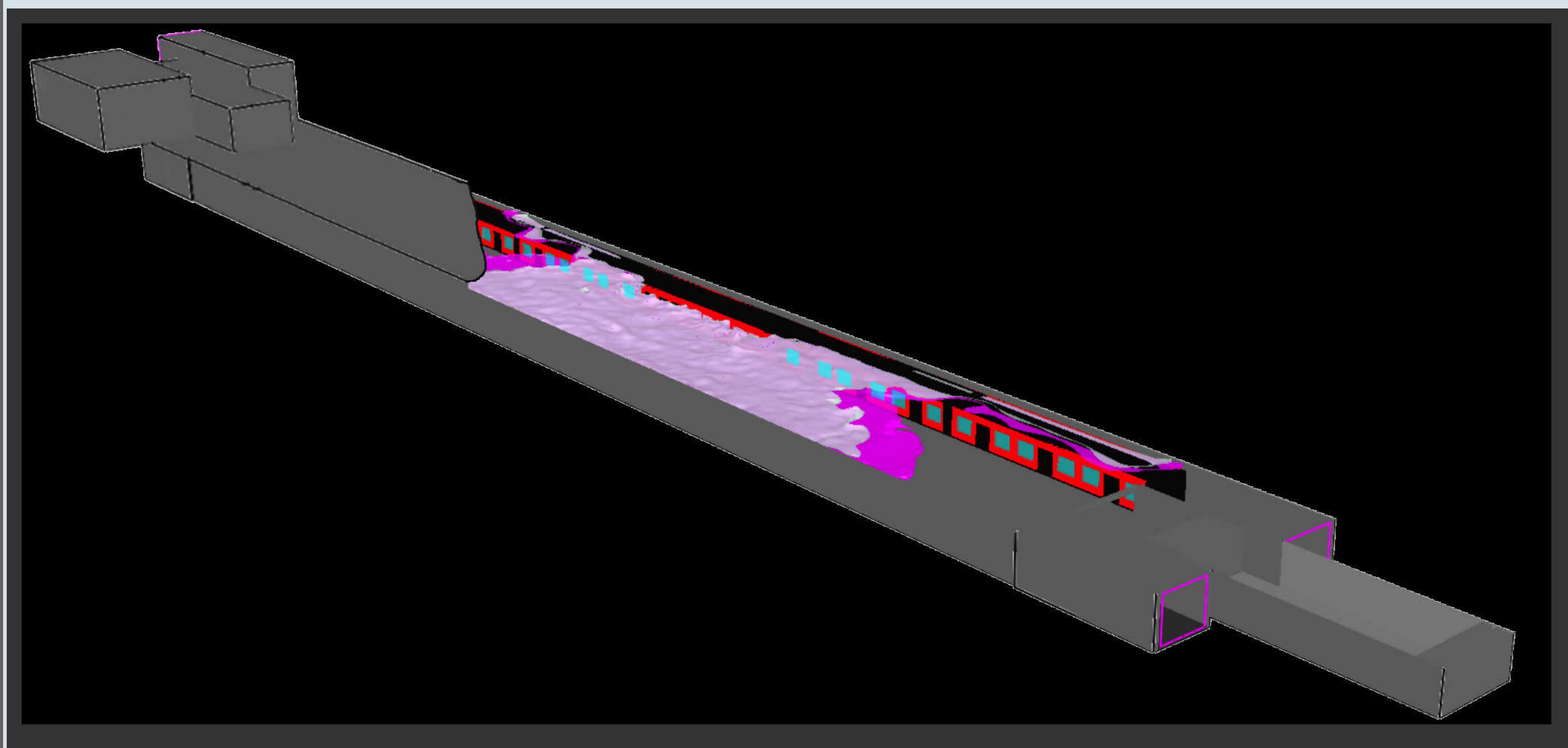


SMOKE AND HEAT EXTRACTION IN UNDERGROUND STATIONS

Evaluation of different concepts in a representative geometry

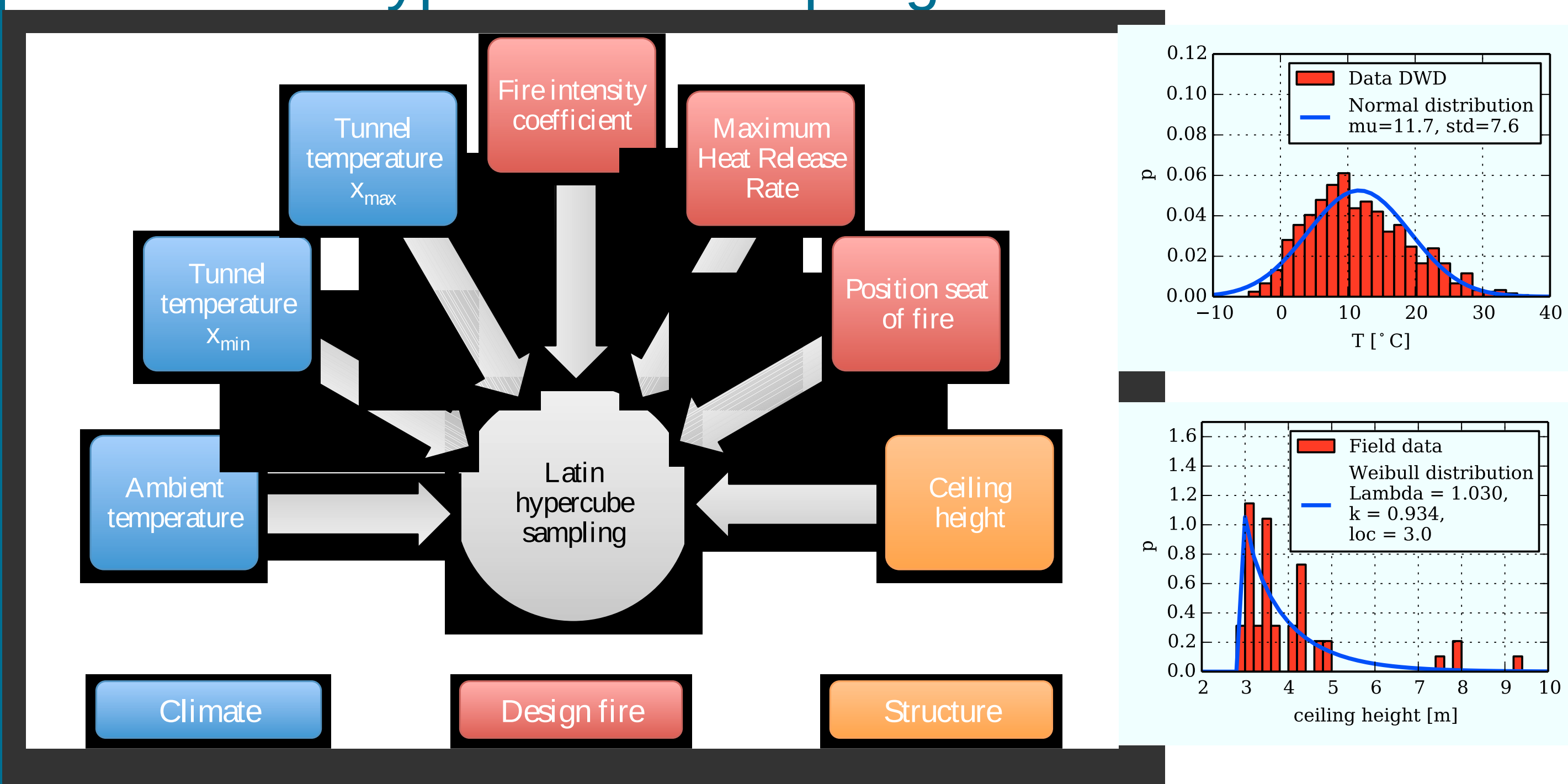


7 parameters

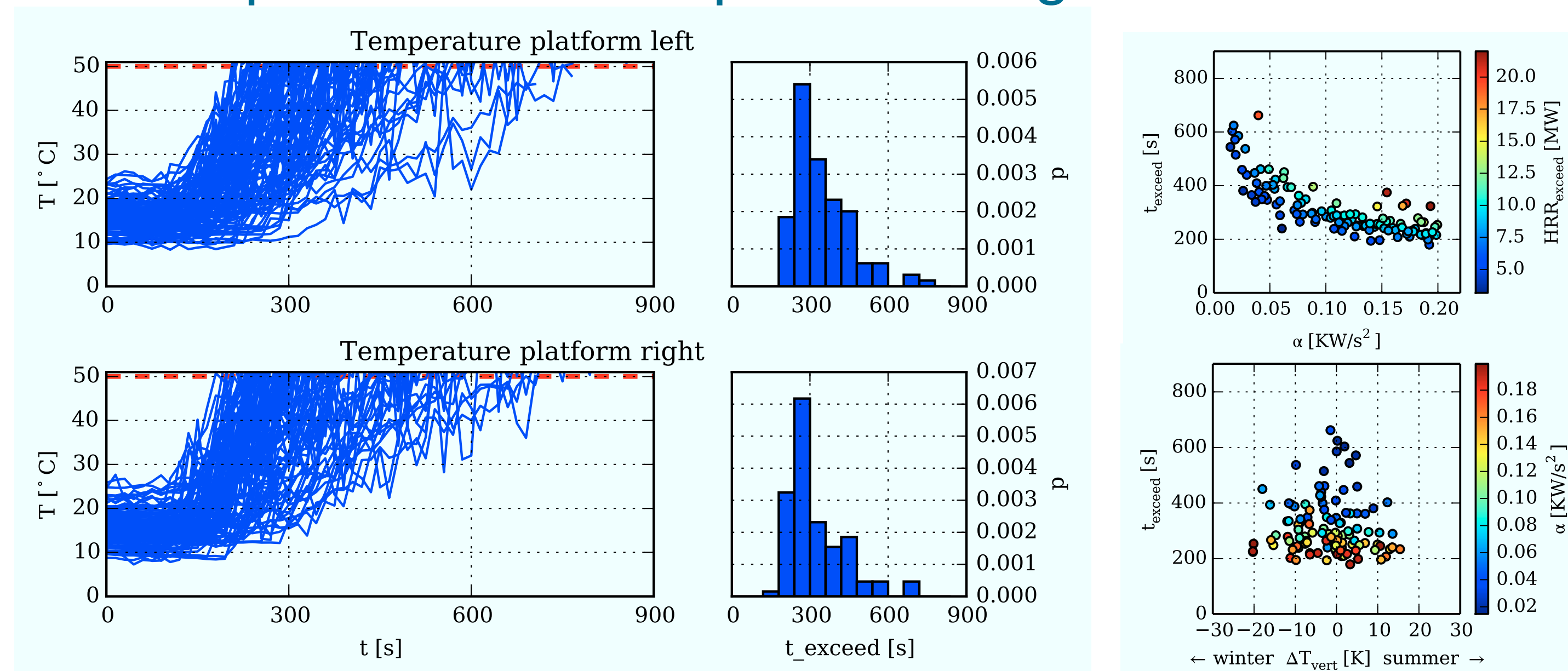
- fire intensity coefficient
 - subway climate
 - natural ventilation
 - hypercube Sampling
 - maximum HRR
 - position of fire
 - ventilation strategies
 - height

Pilot study

- !! structural standard types derived from field data
- !! natural ventilation
- !! Latin Hypercube Sampling:



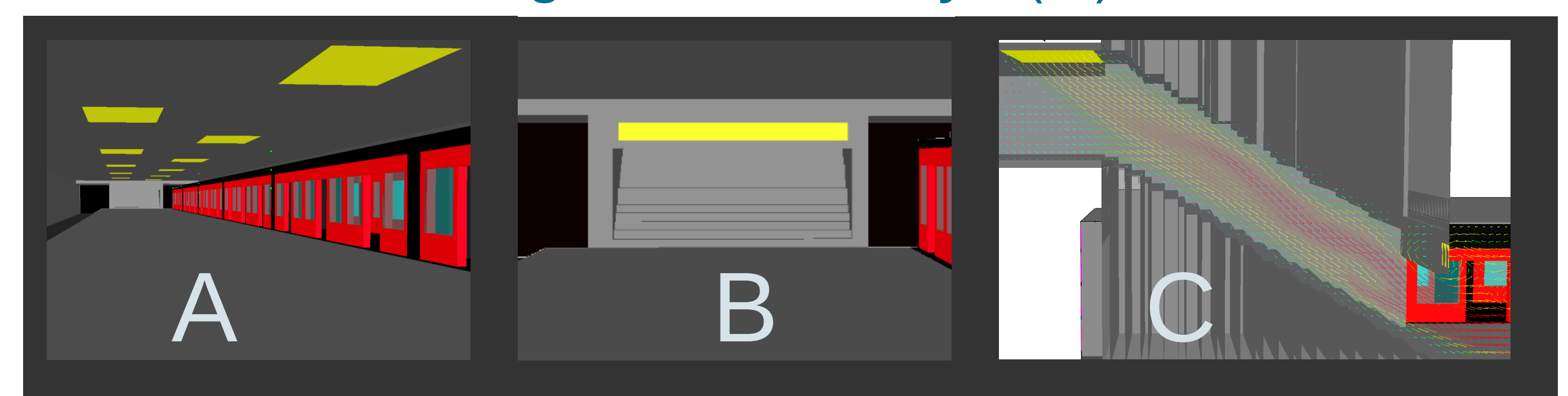
- !! in the first instance: exceedance of tenability temperatures at the platform edges:



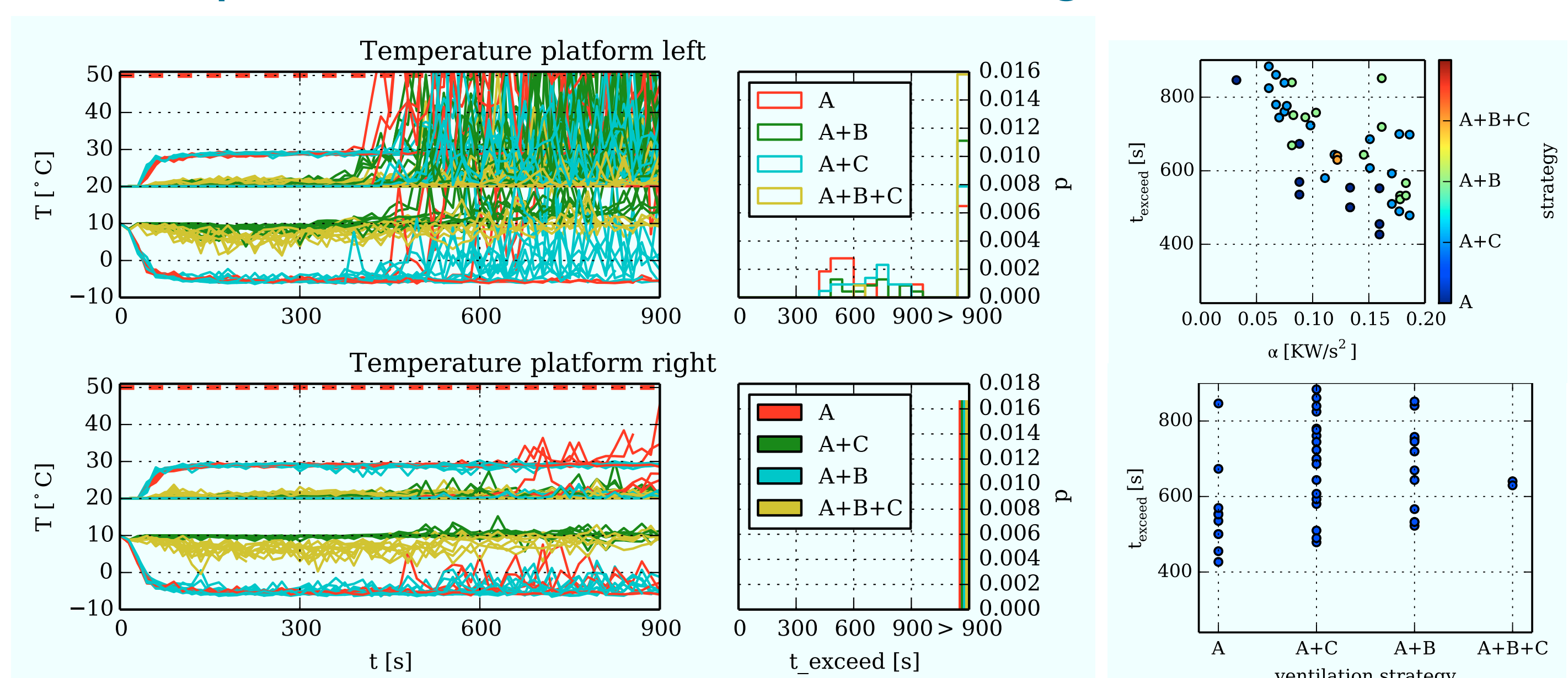
- !! tenability variation from 179 to 580 s
- !! highest correlation: fire intensity coefficient
- !! highest tenability periods at low temperature gradients between underground and surface

Concept study

- !! dimension reduction based on the insights of the pilot study
- !! 4 combinations out of the following mechanical ventilation strategies:
 - !! ceiling extraction (A)
 - !! punctual extraction at the stairway inlet (B)
 - !! inlet air through the stairways (C)



- !! gas temperatures strongly influenced by ambient temperatures and inlet air flow regimes:



- !! increase of tenability periods from 426 to > 900 s
- !! revealed influence position seat of fire

Outlook: extension by assessment of optical and toxic smoke magnitudes