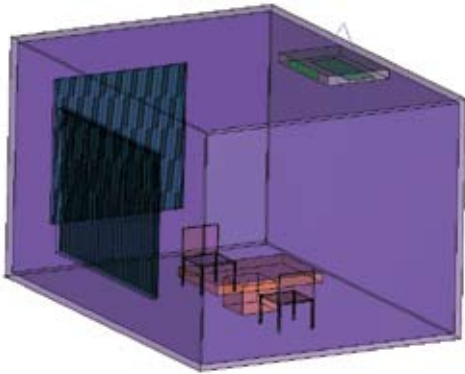


Effect of Solar Radiation and Modeling Approaches of Window Blinds

For applications where sun loading affects heat transfer, scSTREAM can take into account the effect of solar radiation. Selecting the time and geographical location for the calculation prompts thermal energy to be added to model surfaces where the solar rays hit according to the time and latitude/longitude of the location.

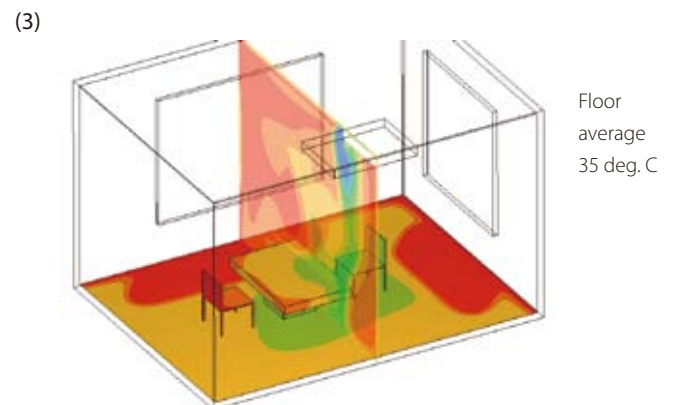
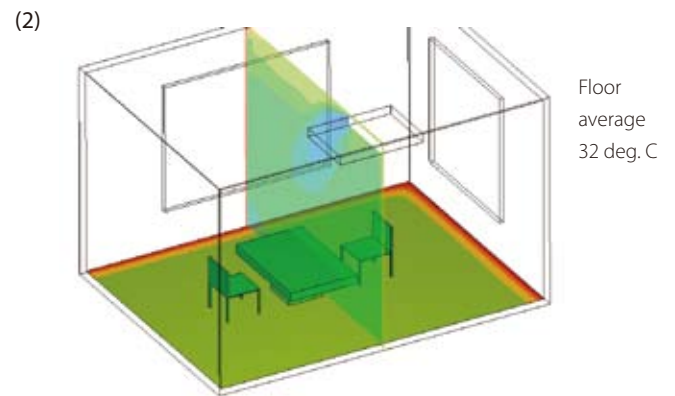
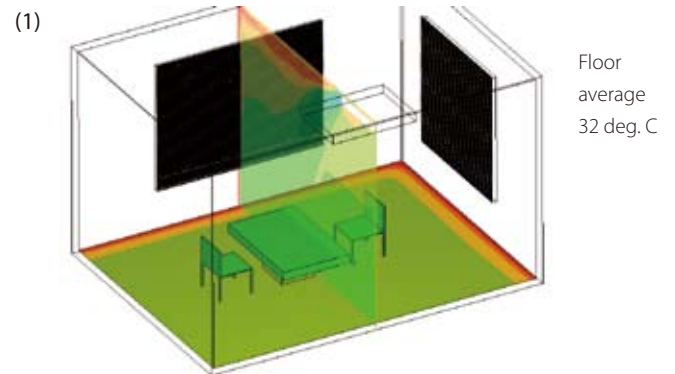
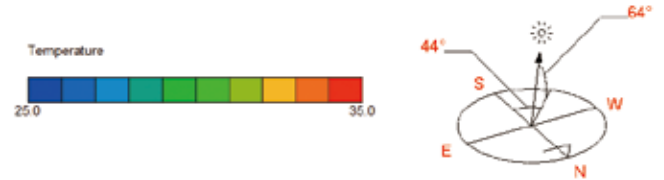
Simulation Model



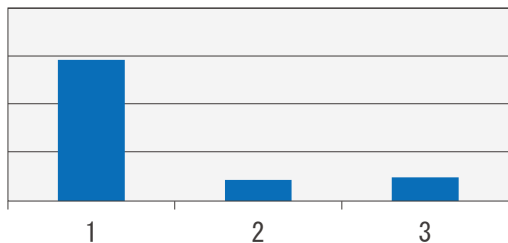
A room with two windows equipped with an air-conditioner at 300W cooling capacity.

- Blinds:
- (1) Detailed blind models (each slat shape is modeled)
 - (2) Simplified blind models (slats are collectively modeled by a single plane with opening ratio of 0.1)
 - (3) No blinds
- Mesh:
- (1) 2.2 M elements
 - (2) 0.6 M elements
 - (3) 0.6 M elements
- Time: August 10th, 13:00
Location: Tokyo, Japan

Simulation Results



Calculation time



Notes

The effectiveness of window blinds for shielding solar radiation was calculated. A simplified model of the blinds produced the same results as the original, more complex blind model and significantly reduced calculation time.