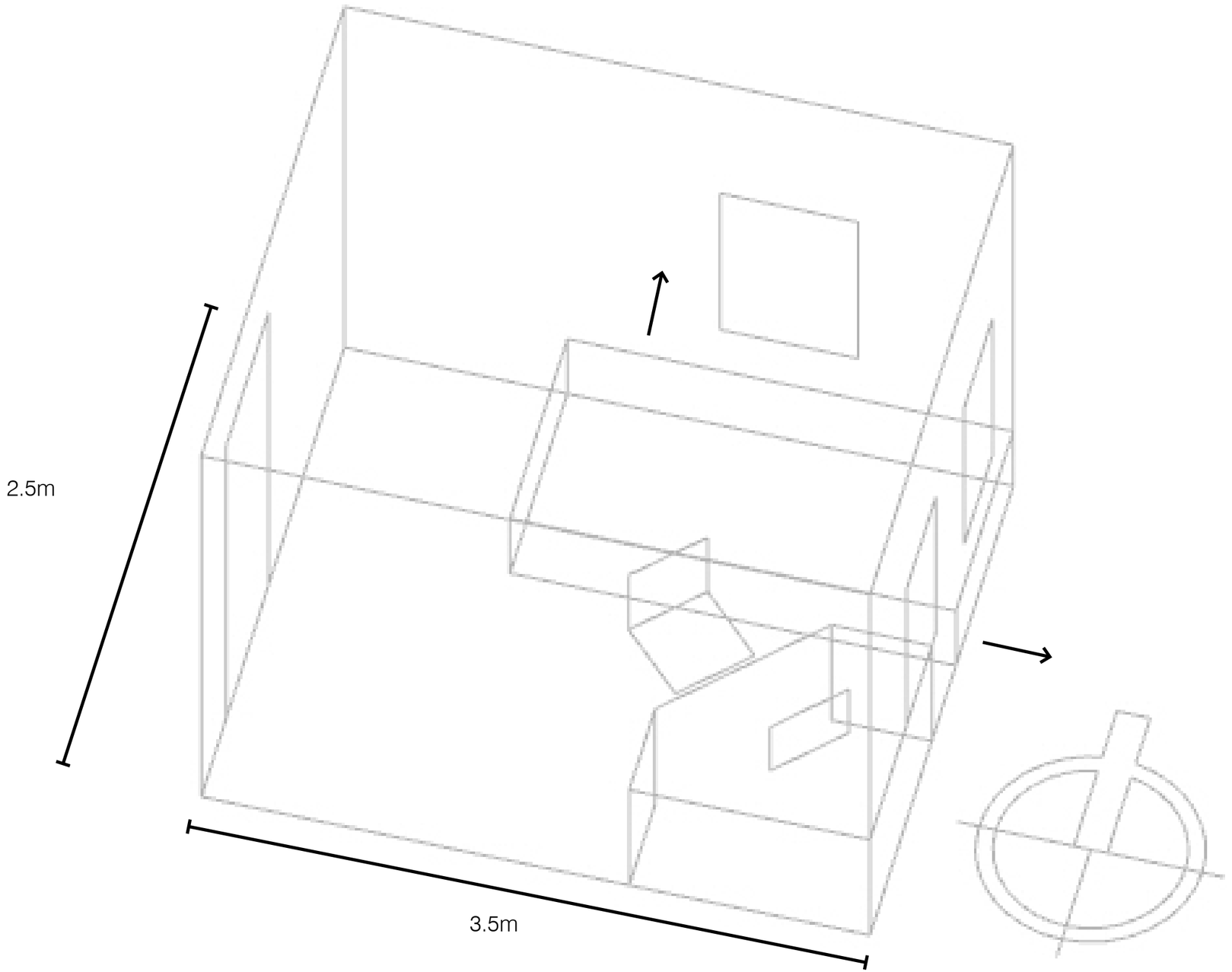
Target Room:

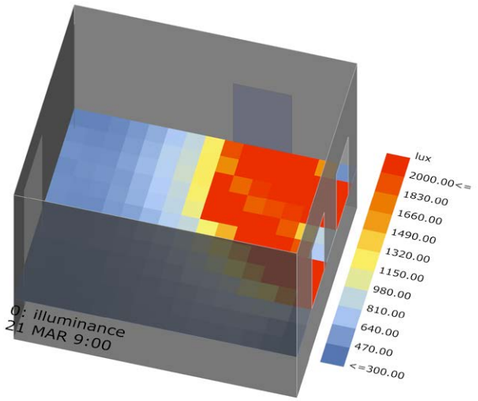
The room is located in Chicago city, with two windows facing east and one facing north. The north and east wall are next to the exterior and the other sides are connected to the livingroom and another bedroom.
The dimention of the room is 3.5*2.5*3m. The desk at the southeast corner is the place I always work from 8am-18pm.

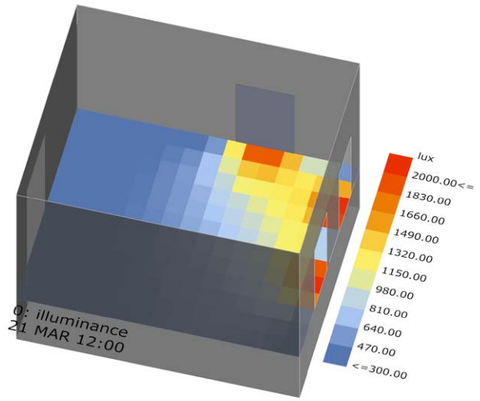


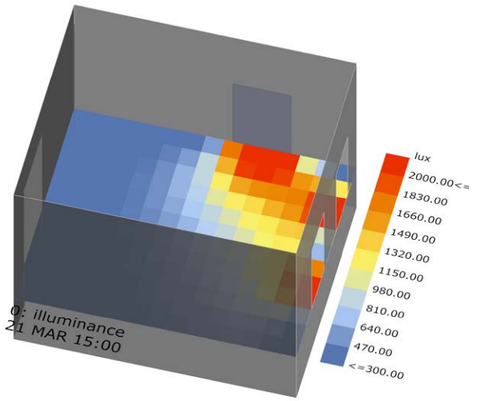
Analysis of Original Daylight Condition:

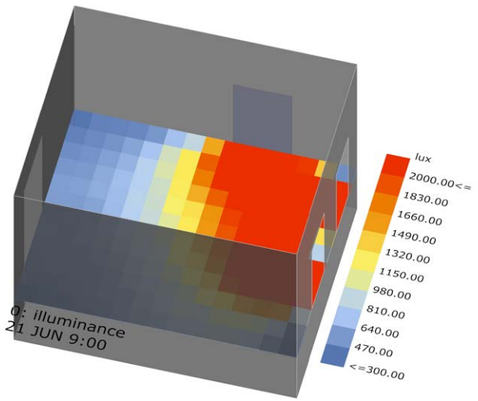
The 9 diagrams show the daylight simulation at 9 different time of the target room :
9am Mar. 21st, 12pm Mar. 21th, 15pm Mar. 21th,
9am Jun. 21st, 12pm Jun. 21th, 15pm Jun. 21th,
9am Dec. 21st, 12pm Dec. 21th, 15pm Dec. 21th.

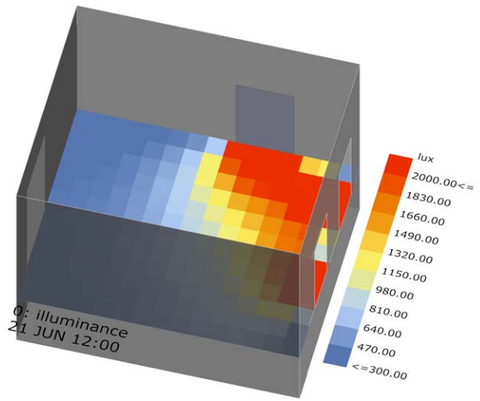
The obvious point is that the west part of the room is always in the lack of daylight(under 300lux). Another problem is that at the east part of the room it often has more than 2000lux in the morning and at noon.

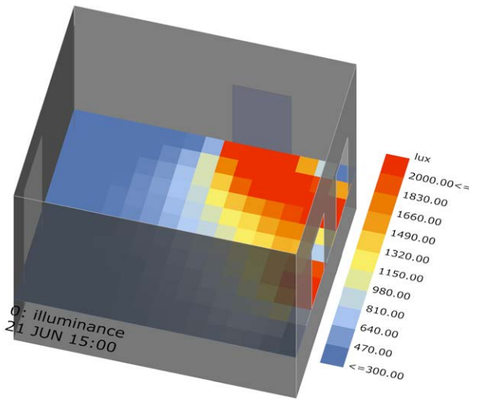


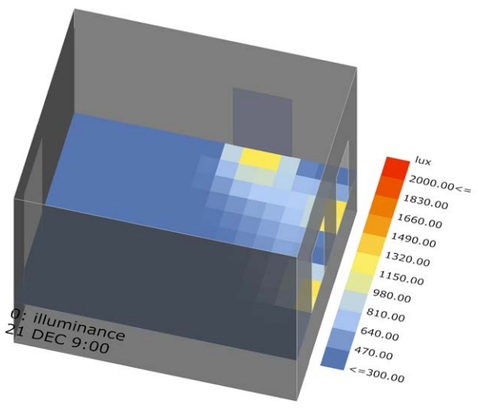


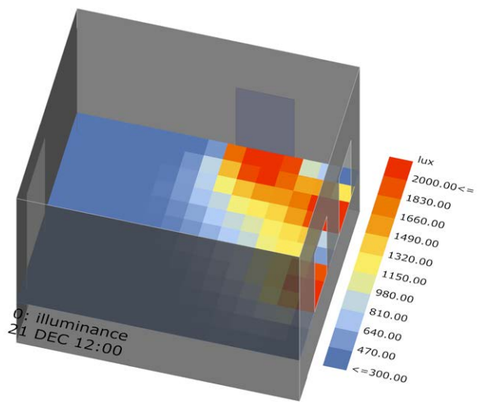


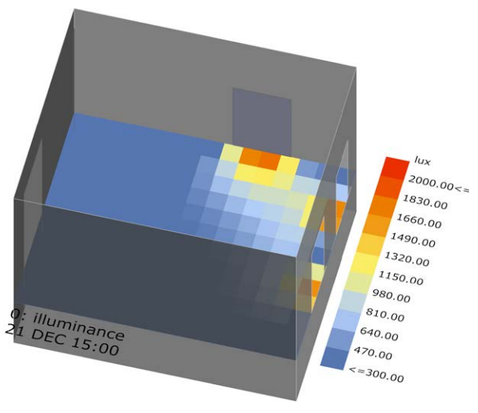








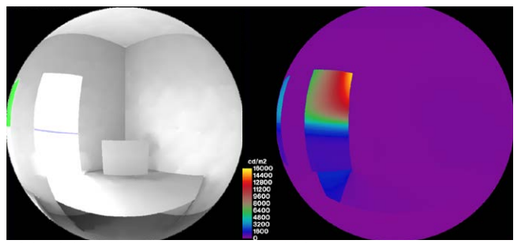


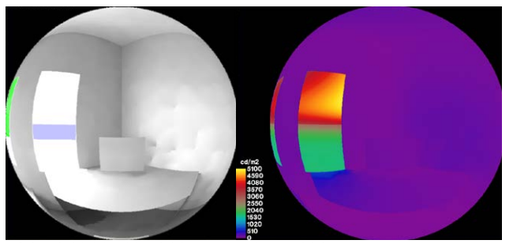


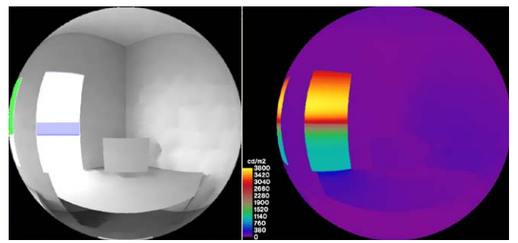
Analysis of Original Glare Condition:

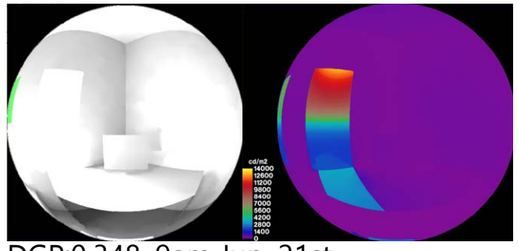
The 9 diagrams show the glar simulation at 9 different time of the target room :
9am Mar. 21st, 12pm Mar. 21th, 15pm Mar. 21th,
9am Jun. 21st, 12pm Jun. 21th, 15pm Jun. 21th,
9am Dec. 21st, 12pm Dec. 21th, 15pm Dec. 21th.

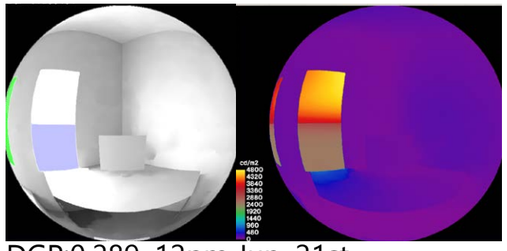
The DGP of all 9 simulations are all under 0.35. But it still has glare problems at 9am and 12pm in March and June.

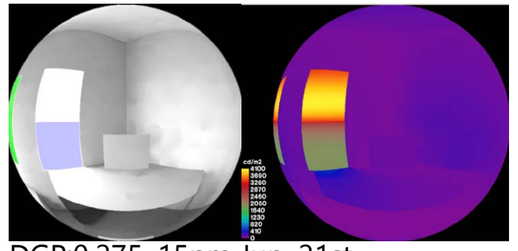

DGP:0.325, 9am Mar. 21st

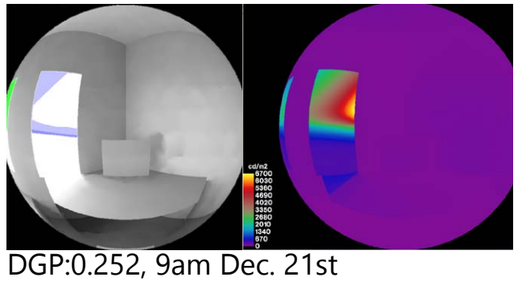

DGP:0.270, 12pm Mar. 21st

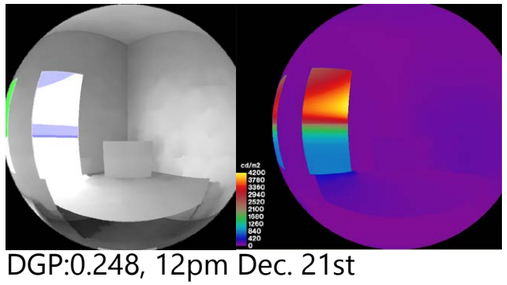

DGP:0.251, 15pm Mar. 21st

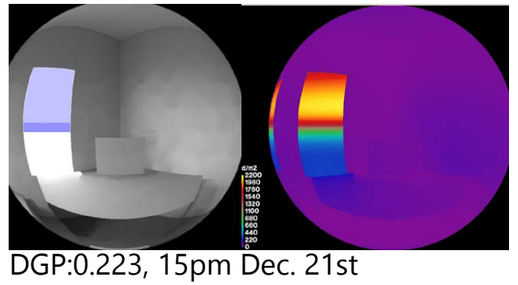

DGP:0.348, 9am Jun. 21st


DGP:0.289, 12pm Jun. 21st


DGP:0.275, 15pm Jun. 21st


DGP:0.252, 9am Dec. 21st

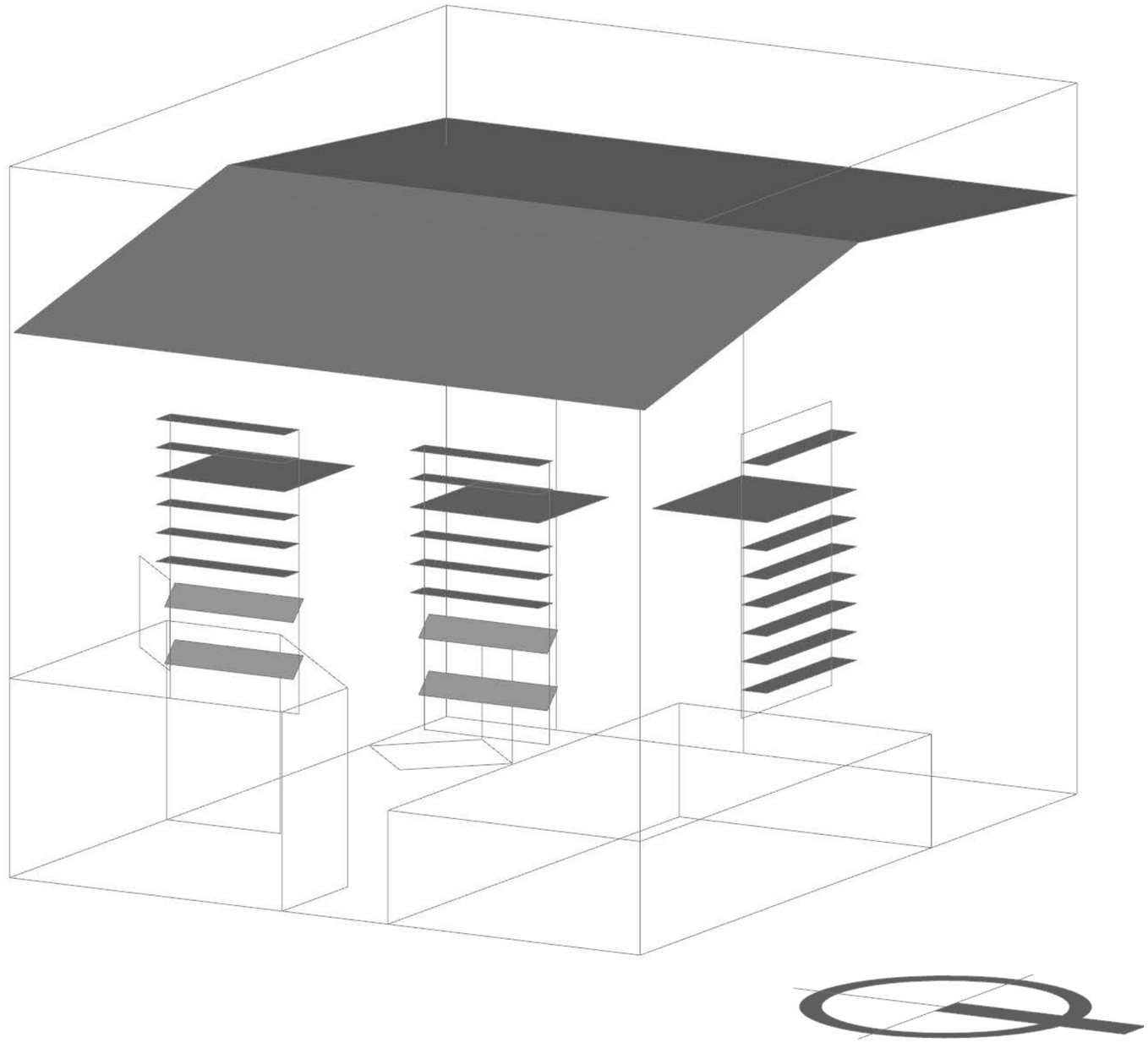

DGP:0.248, 12pm Dec. 21st


DGP:0.223, 15pm Dec. 21st

Sollution:

From the 9 simulation results, I can know that the largest problem of this room is that it will have glare problem in the morning and noon time in Spring, Summer and Fall. The other problem is that the west side of the room is always in the lack of daylight.

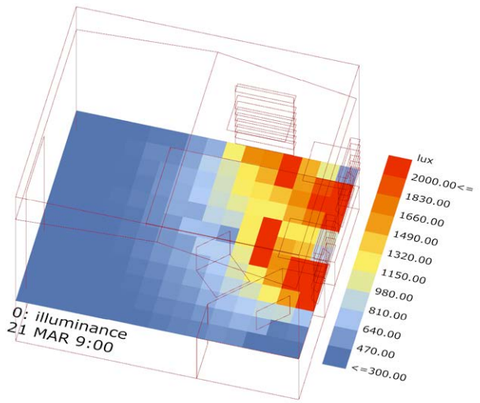
So I try to put some louvers at the north and east windows. Among these louvers, the bottom pieces are designed 45 degrees inclining to solve the glare problem in the morning and at noon. The other pieces are diesigned as horizontal pieces with the third of them entending inside the room to reflect more daylight into the room. The ceiling is designed to gather and reflect the daylight into the back side of the room.

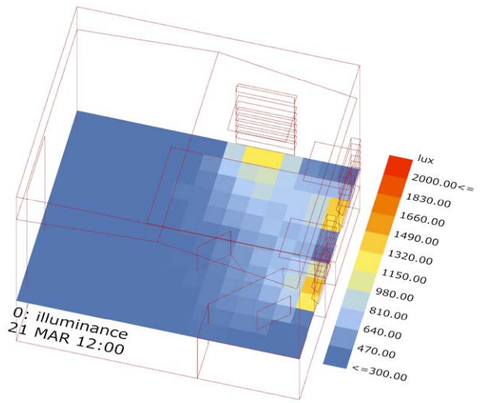


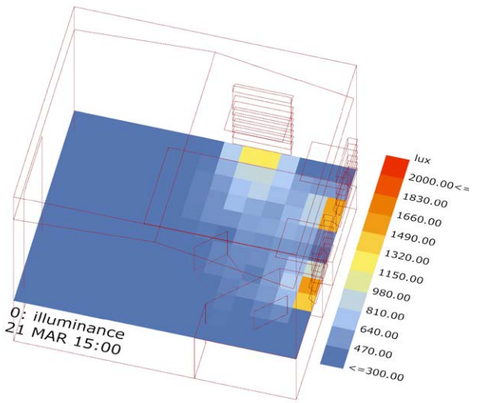
Analysis of Sollution:

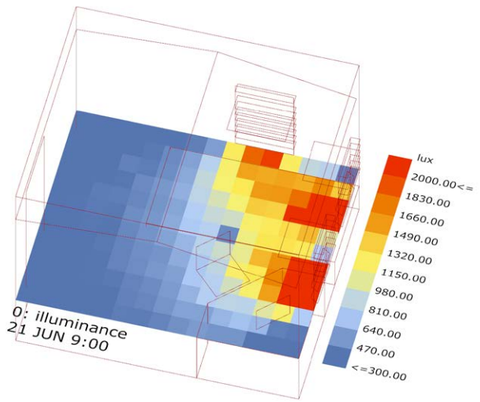
The 9 diagrams show the daylight simulation at 9 different time of the target room after adding the shading system :
9am Mar. 21st, 12pm Mar. 21th, 15pm Mar. 21th,
9am Jun. 21st, 12pm Jun. 21th, 15pm Jun. 21th,
9am Dec. 21st, 12pm Dec. 21th, 15pm Dec. 21th.

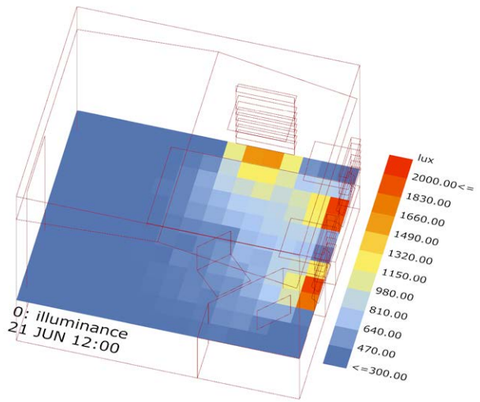
The shading system helps to reduce the glare problems in the area close to window. But it still does not work well at the back part of the room, it even has less daylight than before.

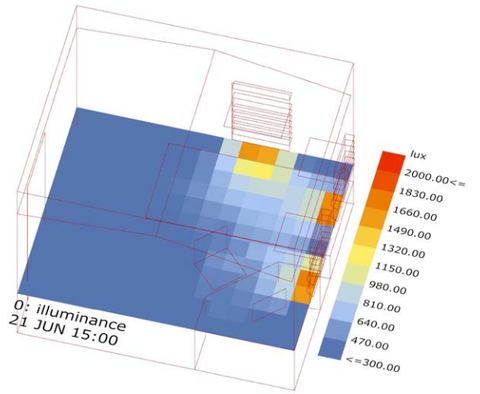


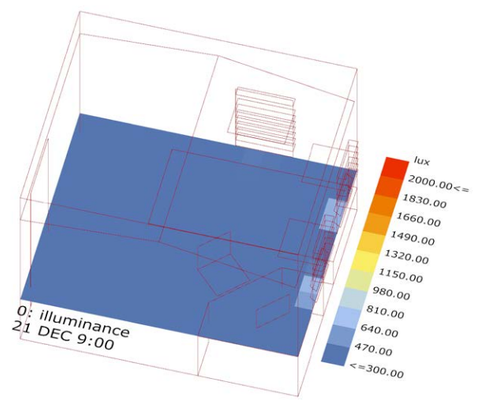


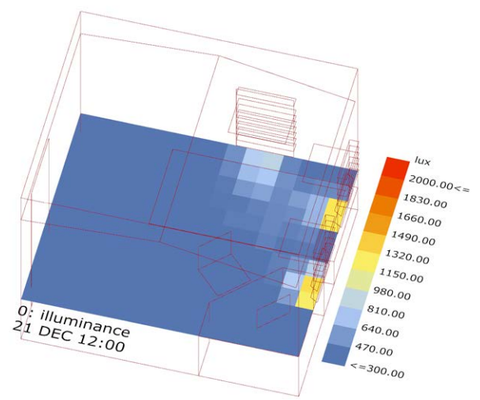


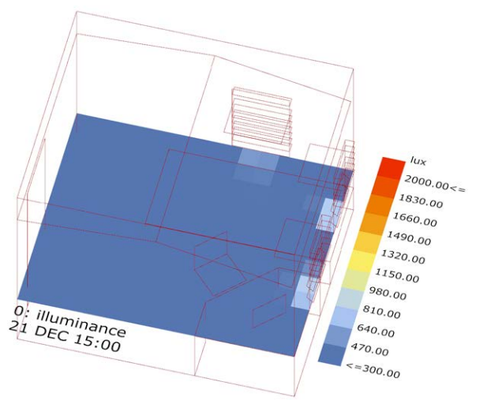






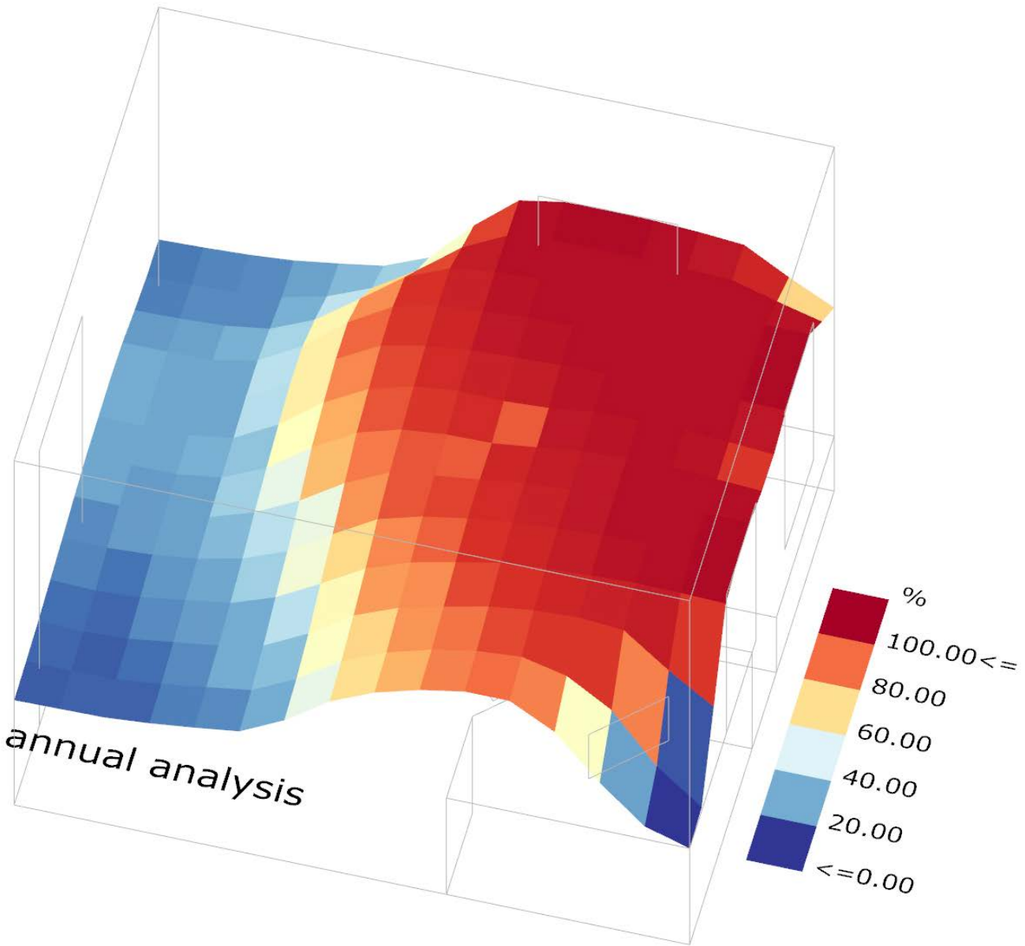




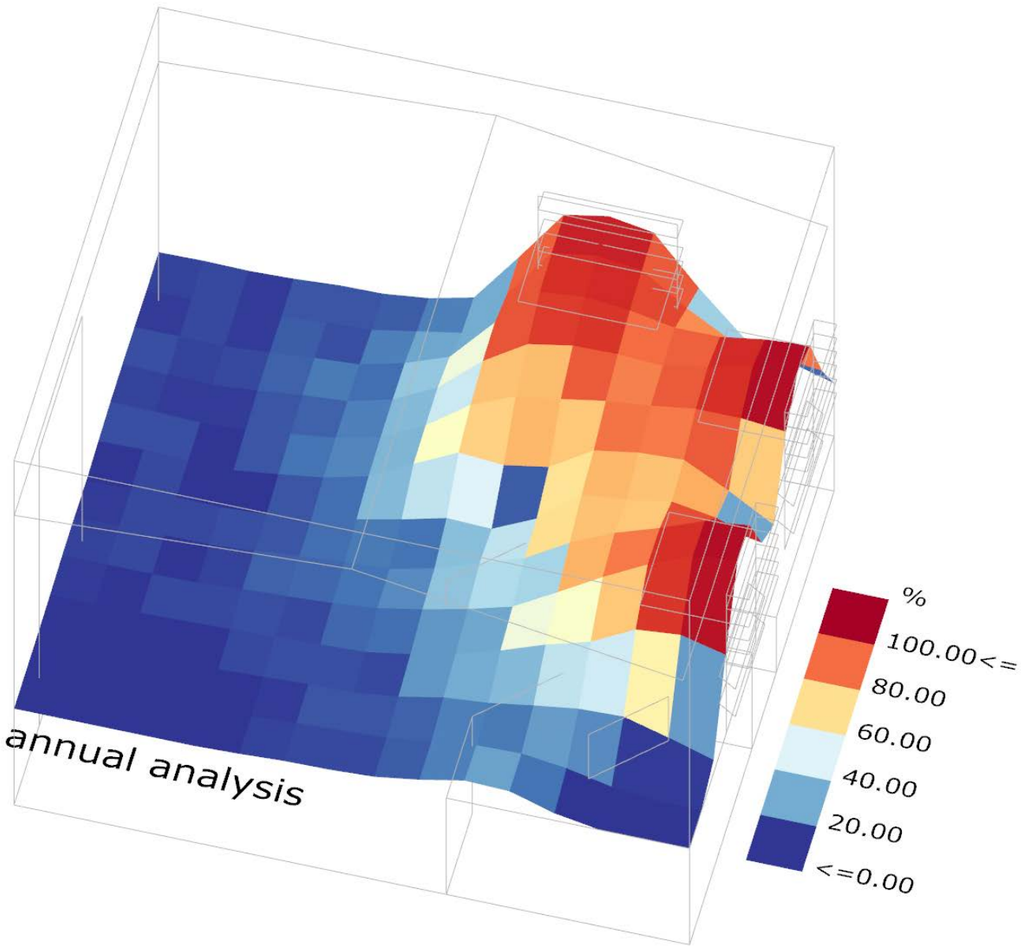


UDI Analysis of Sollution:

The UDI simuilation shows the effect of the new shading on the room daylighting during the whole year. As a conculusion, although the shading system helps to solve the glare problem in the morning, it also reduces the UDI percentage of the whole room. I guess it is because the shading system blocks the daylight in winter.



Before



After