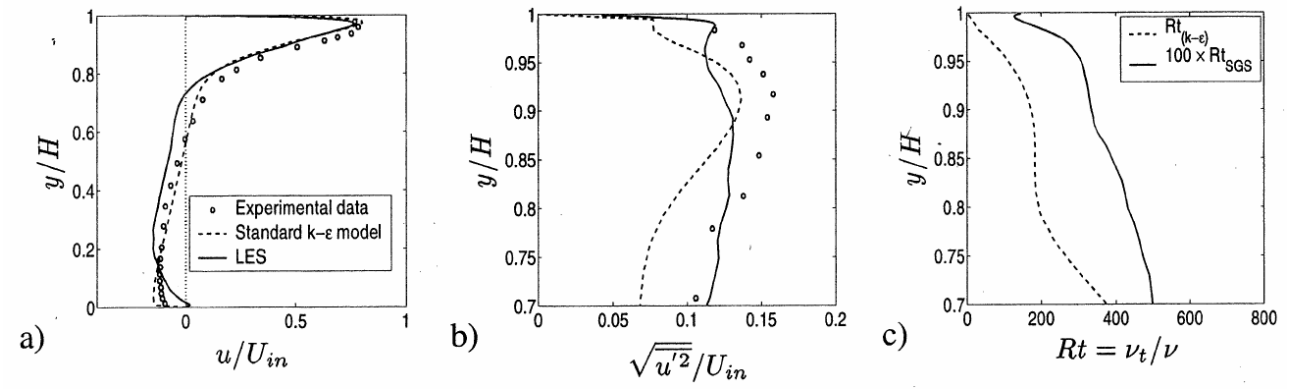
Peng, S.-H. and L. Davidson, The Potential of Large Eddy Simulation Techniques for Modelling Indoor Air Flows, Air Distribution in Rooms, (ROOMVENT 2000), Elsevier 2000.

Standard k-ε model and LES are compared in the 2D benchmark test.

The LES does not show an improvement of the mean flow predictions compared with the standard k-ε model and it is even worse in the near floor region. This is probably due to the use of the log-law wall function which is unsuitable for instantaneous flows, and to the relatively coarse grid used. The resolution for the turbulence quantities is reasonable, however, as shown in the figure since the SGS model accounts only for the small scale eddies the SGS eddy viscosity should be much smaller than the entire turbulent eddy viscosity obtained from a RANS model. The figure also shows that the SGS ν_t is two orders lower in magnitude than the RANS ν_t in the near ceiling wall jet.



Mixing ventilation flow. a) Mean velocity at x = H. b) Turbulence intensity in the wall jet at x = H, c) Ratio of SGS/RANS eddy viscosity to molecular viscosity, Rt = ν_t/ν in the wall jet at x = H.