The Performance of a Scaled-Down Fluidized Loop Seal

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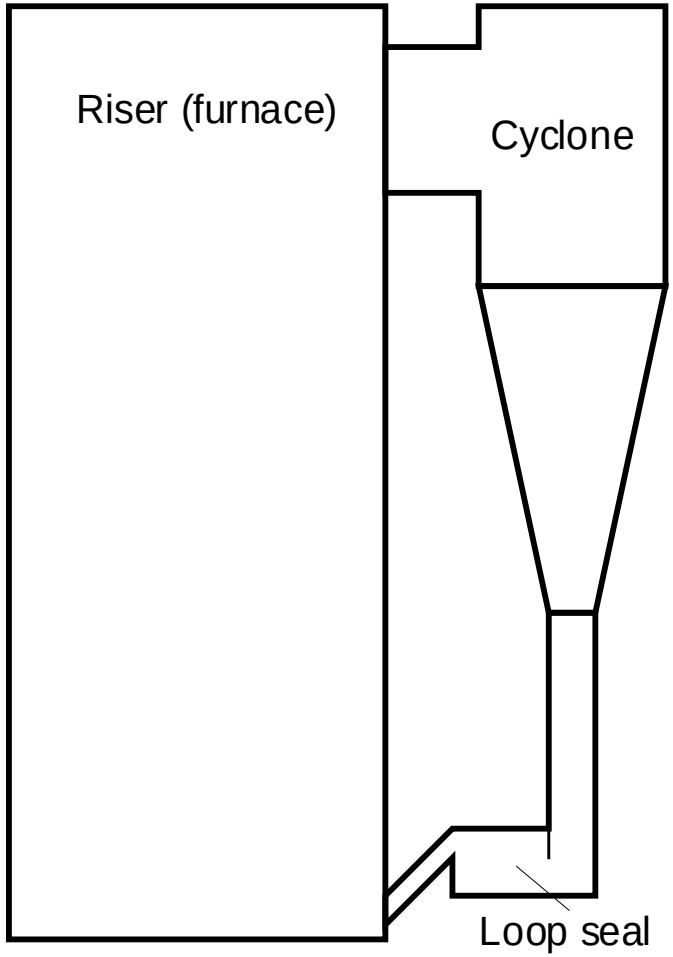
Outline of presentation

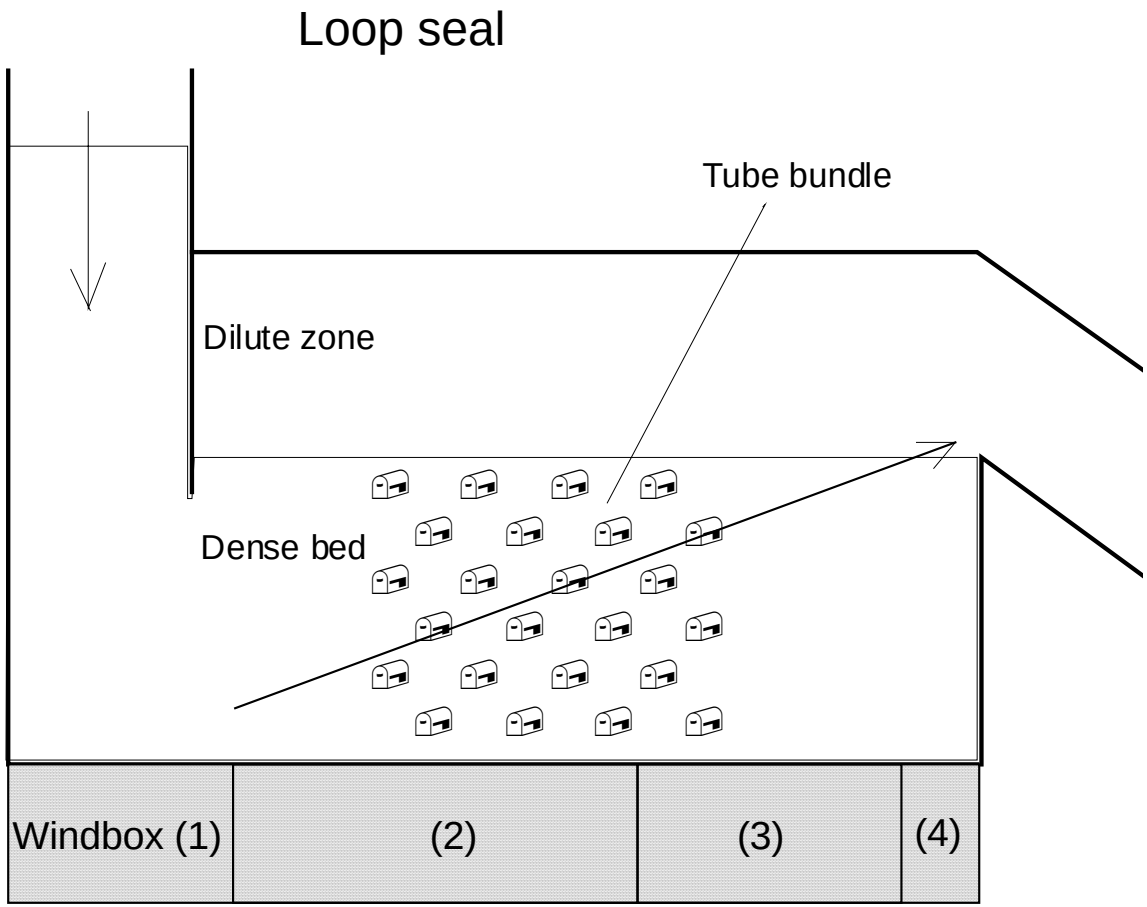
- Background
- Method
- Results
- Conclusions



Background

- Erosion-corrosion pattern / solids flow pattern?

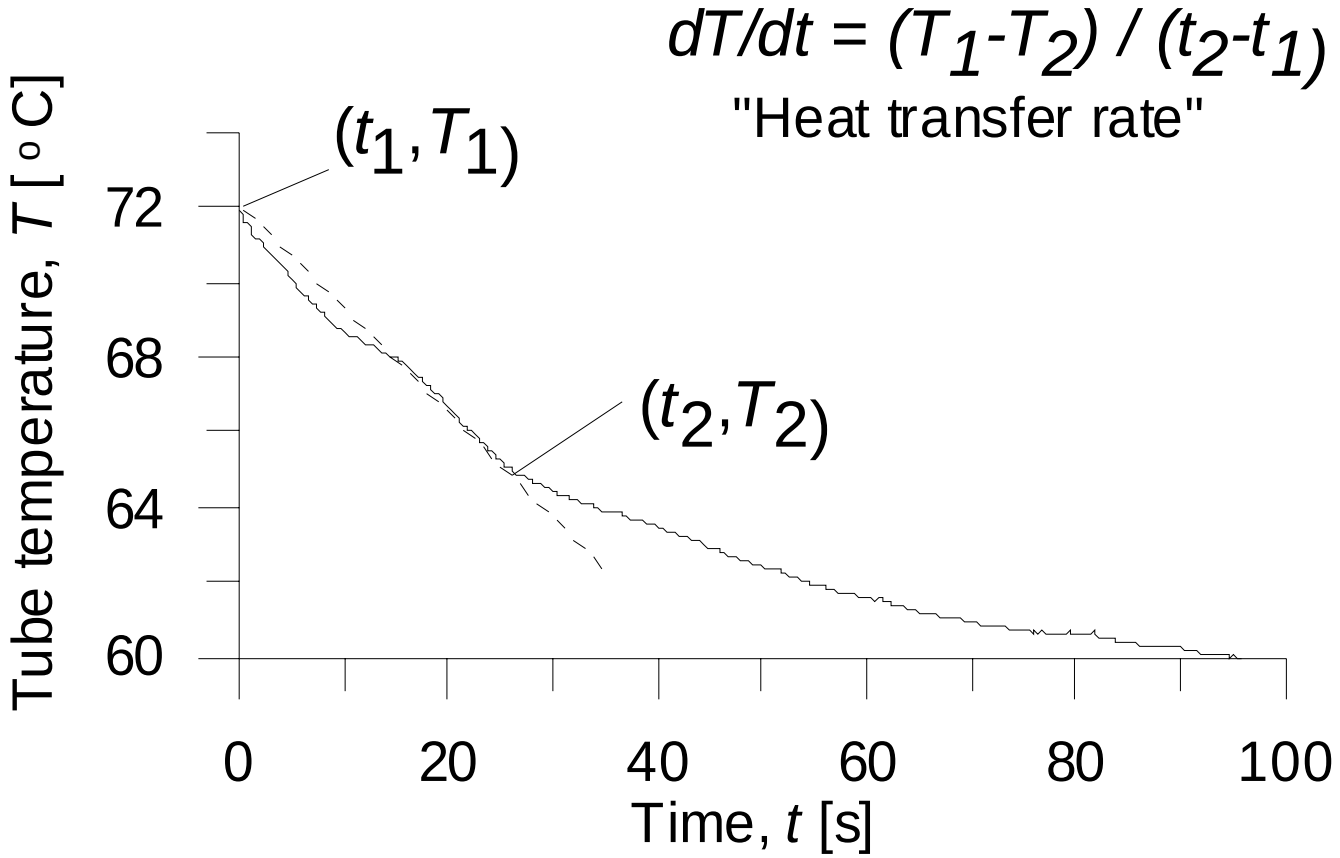
  - Required fluidized fraction of the bottom area?
  - Required gas flow?



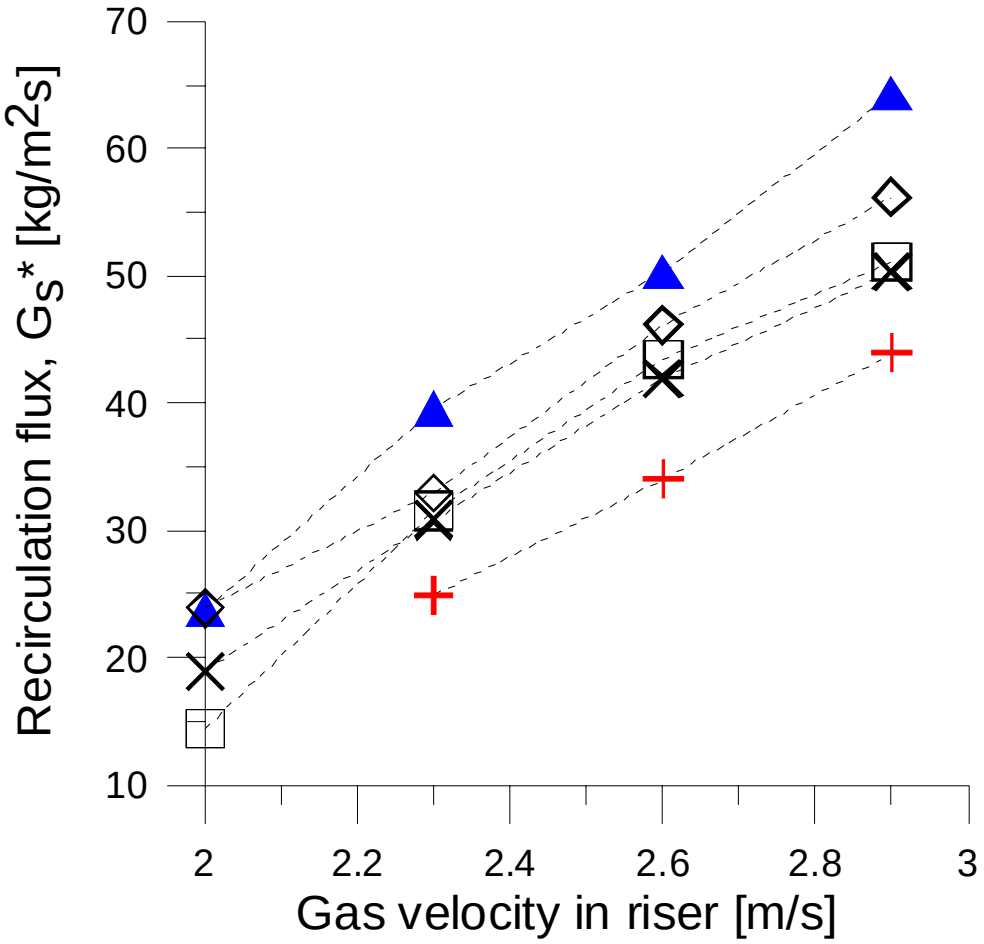
Method

Tube temperature measurements (transient)

Decrease in tube temperature *vs.* time



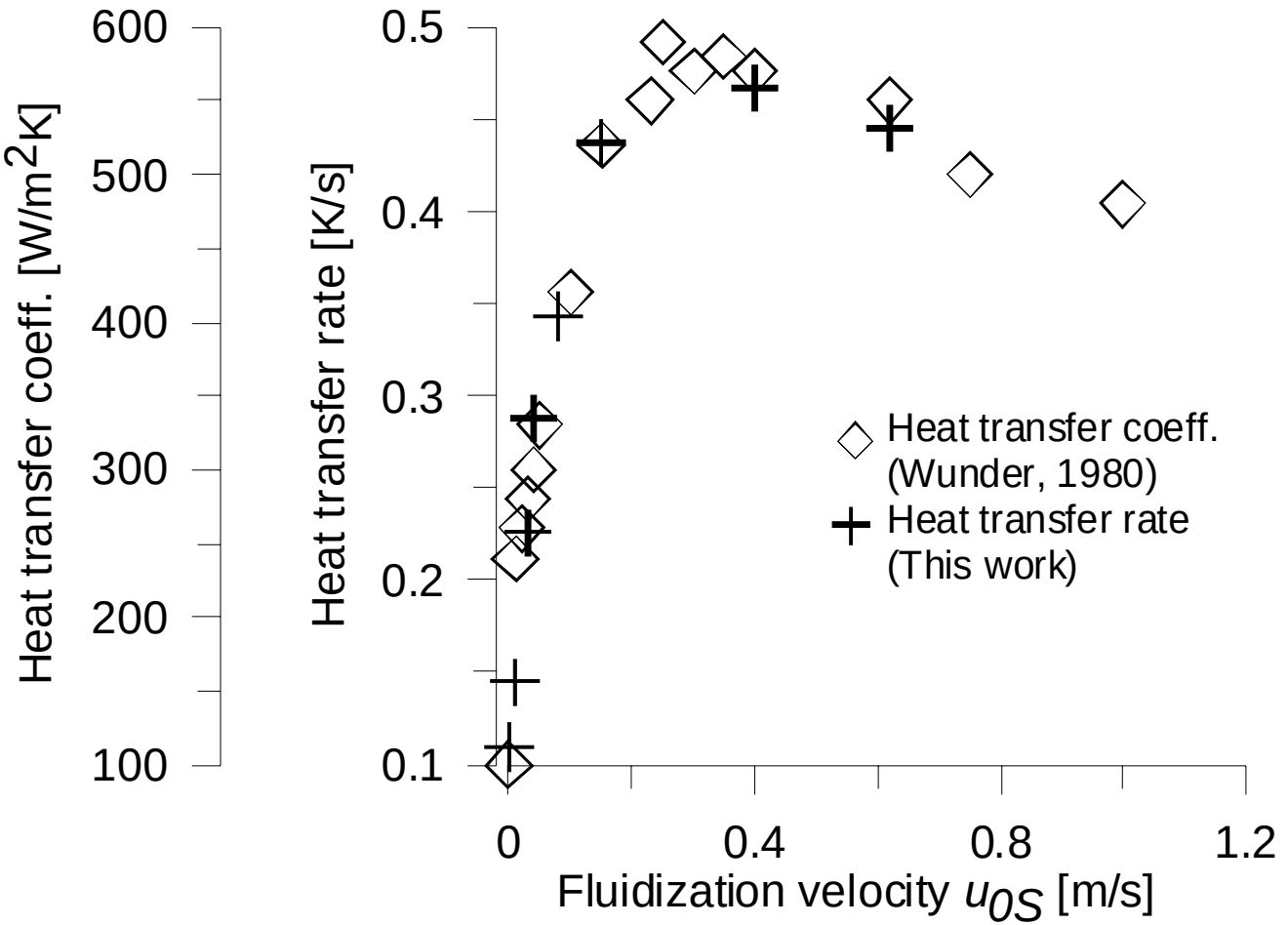
Recirculation flux for different gas velocities



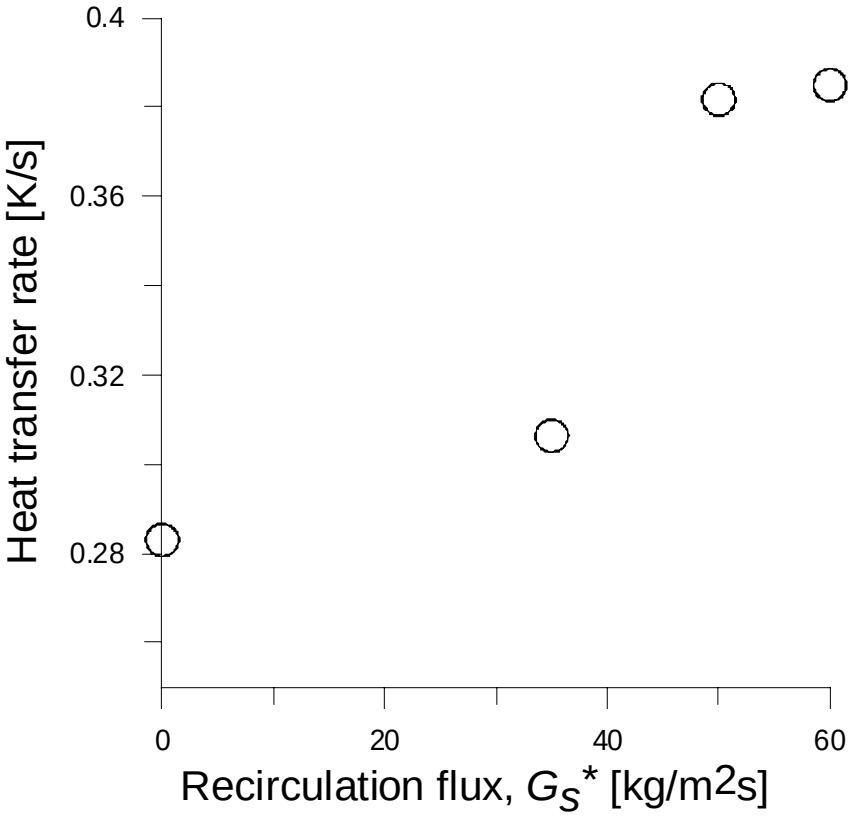
Fluidization velocity

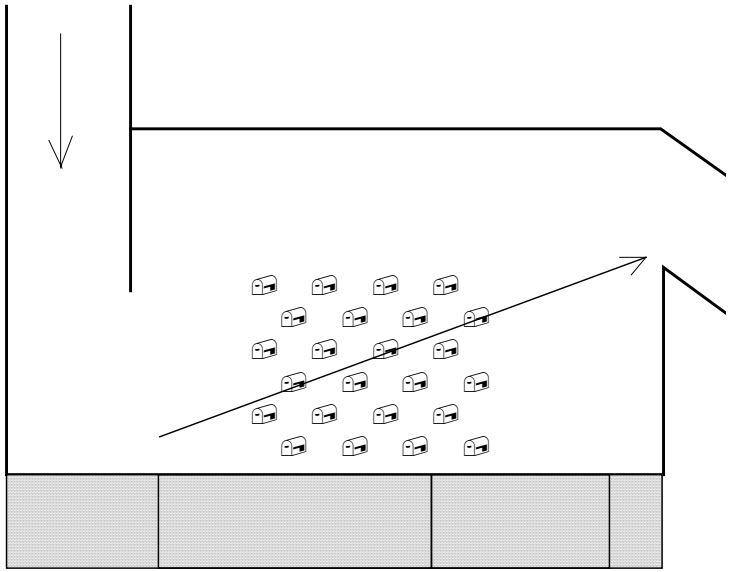
- $u_{0,S}$=0.65 m/s, (B)
- $u_{0,S}$=0.65 m/s, (C)
- $u_{0,S}$=0.65 m/s, (D)
- $u_{0,S}$=0.40 m/s, (B)
- $u_{0,S}$=0.20 m/s, (B)

Heat transfer rate and heat transfer coefficient - influence of fluidization velocity

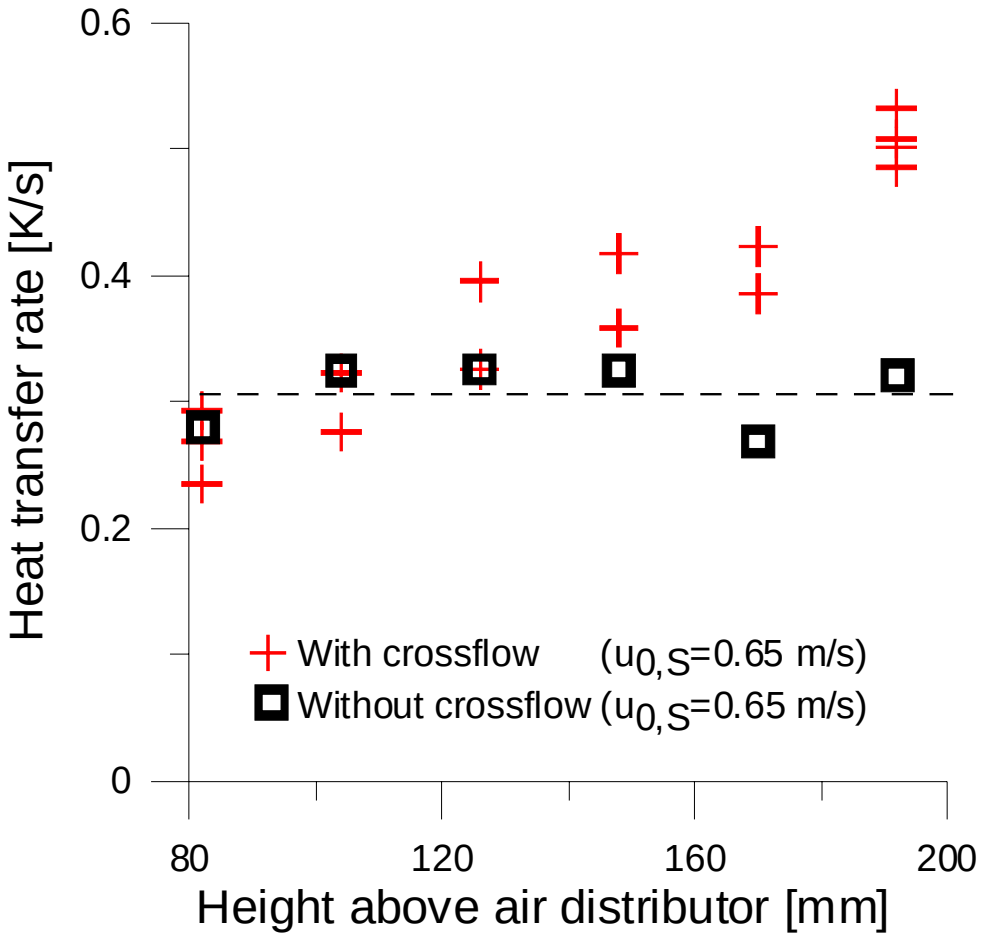


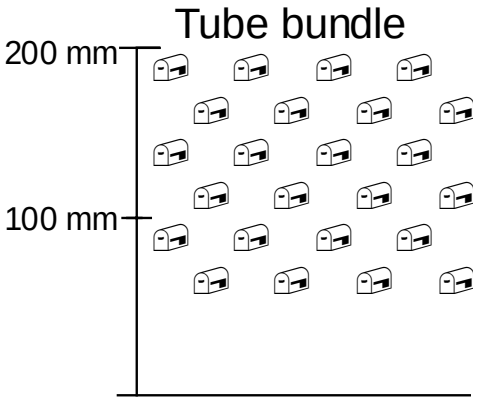
Average heat transfer rate for the tube bundle *vs.* recirculation flux



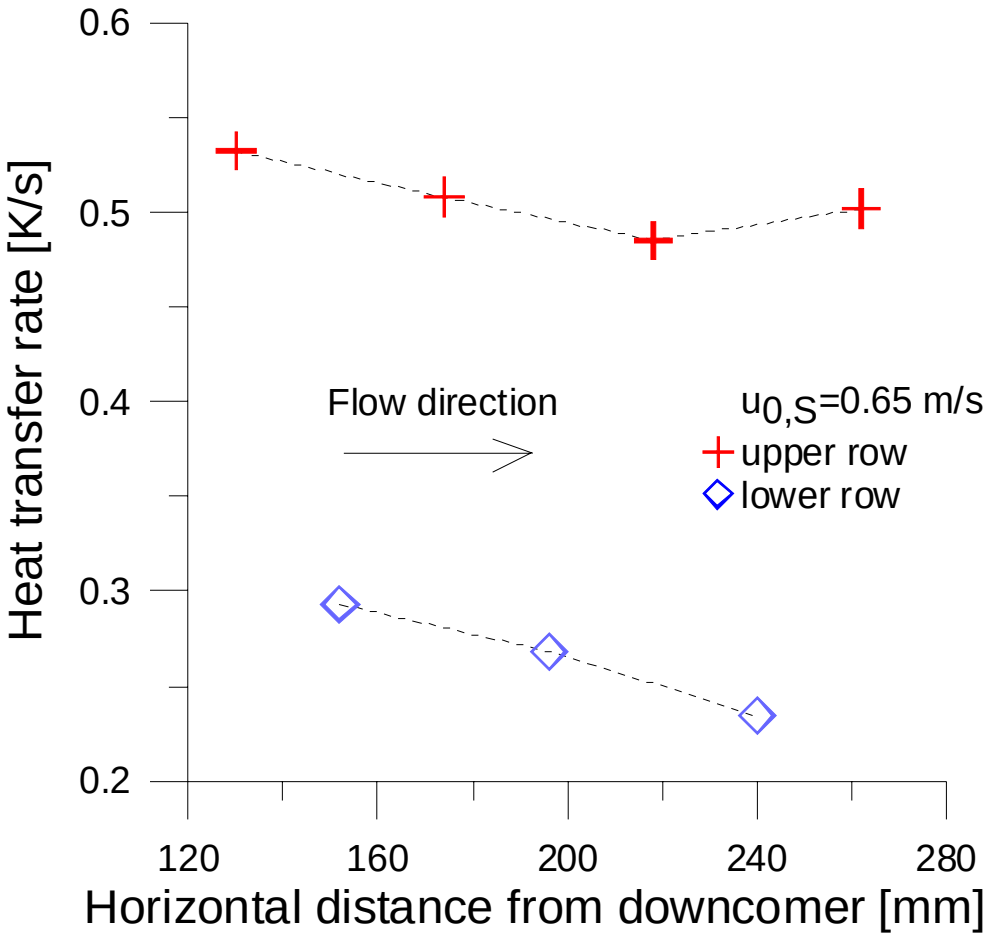


Vertical distribution of heat transfer rate

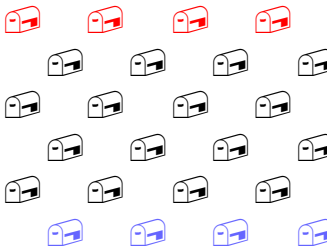




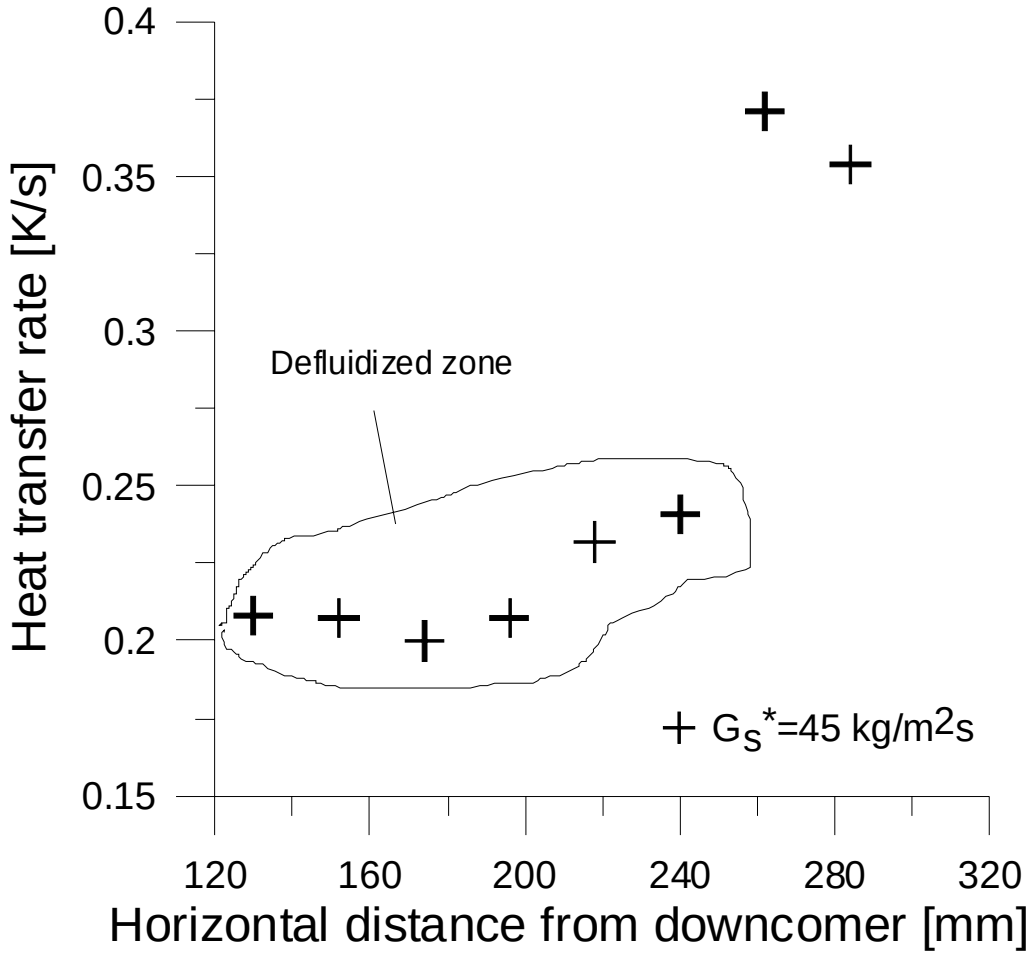
Lateral comparison of heat transfer rate for tubes in upper respectively lower tube row



Tube bundle



Lateral comparison of heat transfer rates. 10% of the bottom area fluidized.



Conclusions

- Differences in solids flow pattern is investigated by tube temperature measurements
- The heat transfer rate increased with height and decreased with distance from downcomer
- The mean heat transfer rate increased with the recirculation flux of solids
- Recirculation was maintained even when the fluidized fraction of the bottom area or the gas flow to the loop seal was substantially decreased. However for defluidized zones the heat transfer rate decreased