

## **ACOUSTICS2008/738**

### **Geometry effects and scaling in thermoacoustics**

Jos Zeegers

Eindhoven University of Technology, Den Dolech 2, 5612 AZ Eindhoven, Netherlands

Current work at TU Eindhoven on thermoacoustics will be discussed. The end effects of the geometry of a stack on the performance of thermoacoustic machines will be shown. End effects and the formation of vortices is an issue that contributes to enhanced convective losses at the stack ends. Influence of Reynolds and Strouhal numbers on the oscillatory flow field in the stack are studied. It is possible to plot Sr and Re number diagrams in which various zones can be identified that display characteristic flow patterns. Furthermore the influence of the type of regenerator material is studied in traveling wave engines. Performance of honeycomb material of high-density pores is compared with wire screen regenerators in a thermoacoustic motor. As a last point the effects of downscaling to miniature systems is discussed. Limits of how far the size of a thermoacoustic cooler can be downscaled before conduction effects limit the performance are relevant.