

## Reference models

- Longwave heating rates: (Provided by W. Zhong, Imperial College, UK)

GENLN2 line-by-line model (Edwards, 1988)

- gaseous absorption by H<sub>2</sub>O, CO<sub>2</sub>, O<sub>3</sub>
- clear sky conditions
- no aerosols

- Shortwave heating rates: (Provided by W. Zhong, Imperial College, UK)

ES220 narrow-band-model (Edwards and Slingo, 1996)

- includes 220 spectral bands (0.2 to 10 μm)
- gaseous absorption by H<sub>2</sub>O, CO<sub>2</sub>, O<sub>3</sub>
- clear sky conditions
- no aerosols

- also planned: SW and LW line-by-line calculations by V. Ramaswamy