

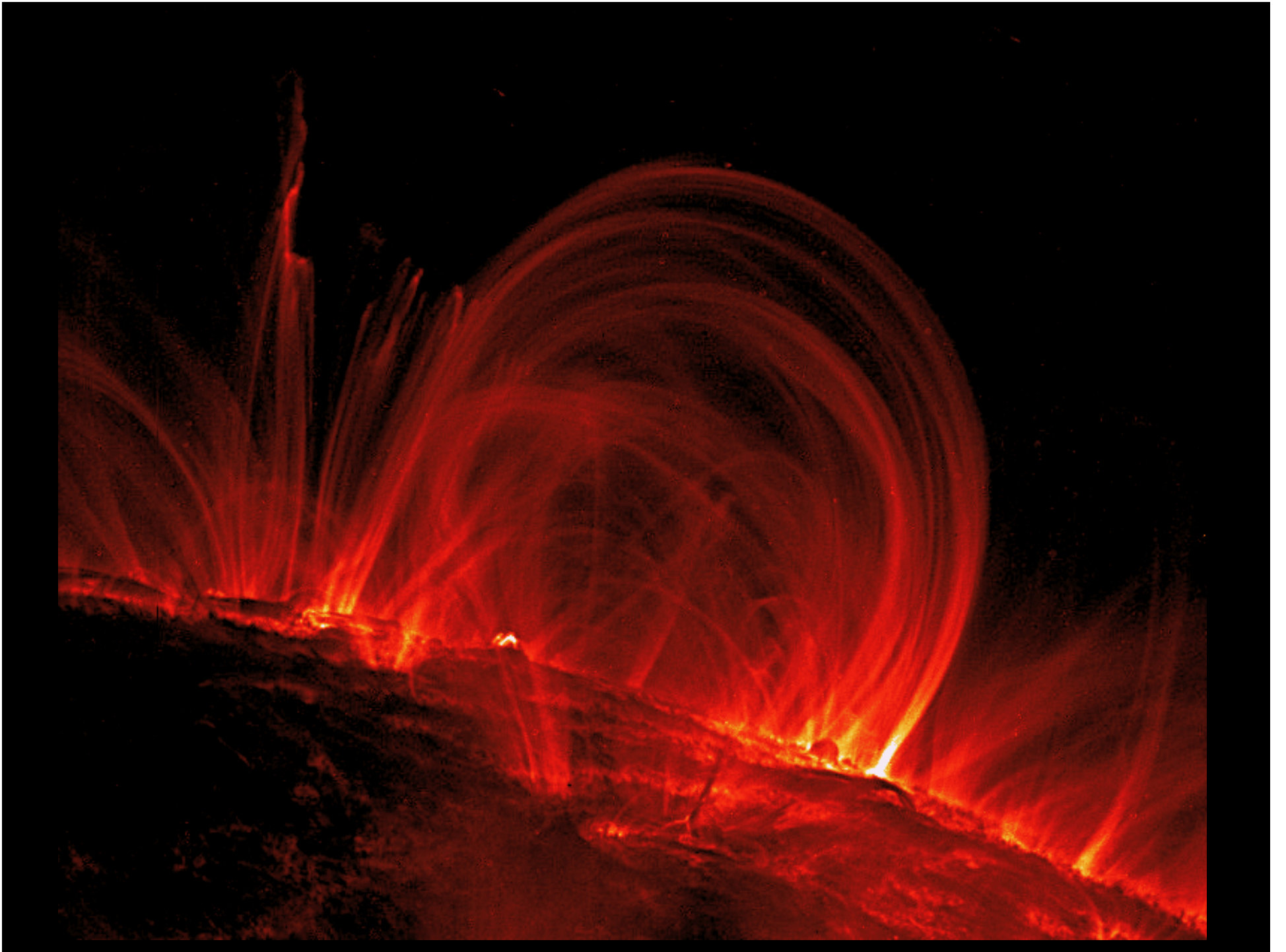
# Differential emission measure signatures of coronal heating

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# DEM and coronal heating

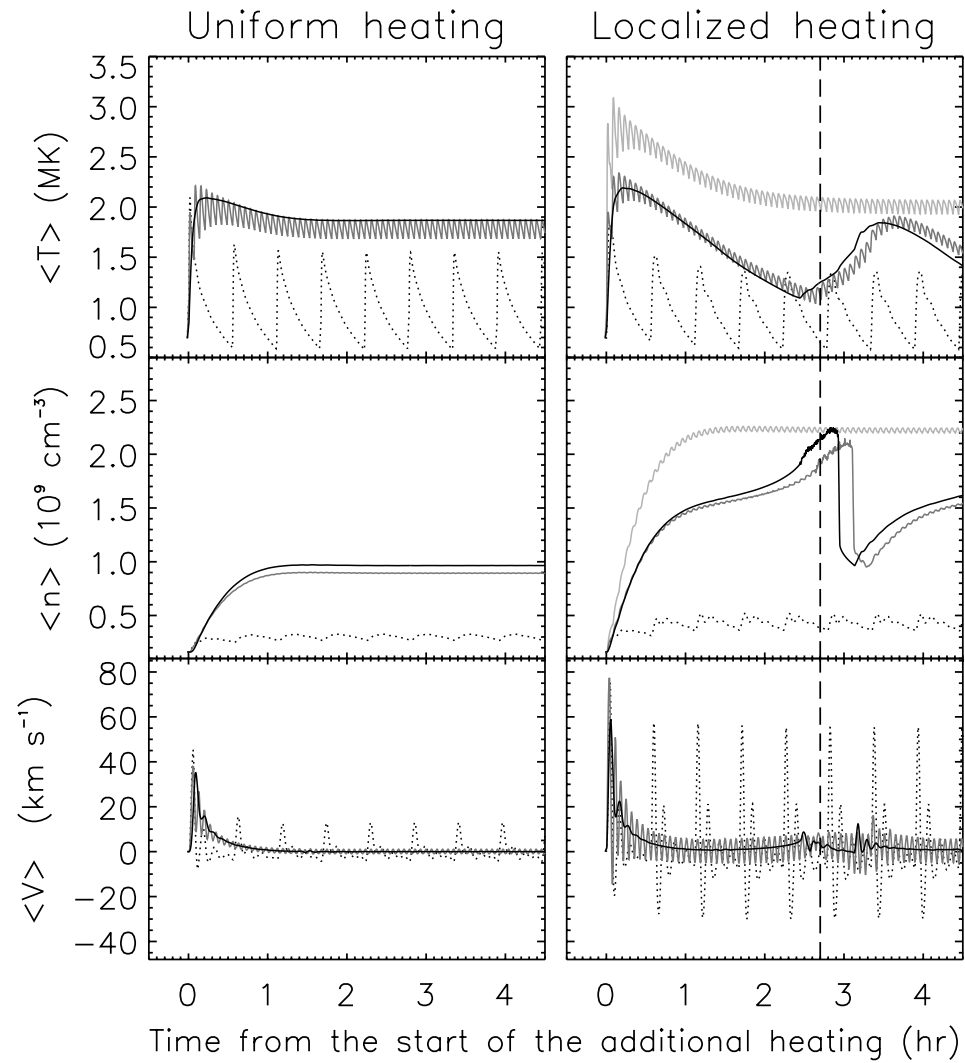
- What differential emission measure tells us?
- Just controlled by plasma emission properties?
- What heating signatures can be seen?

# Synthetic DEM

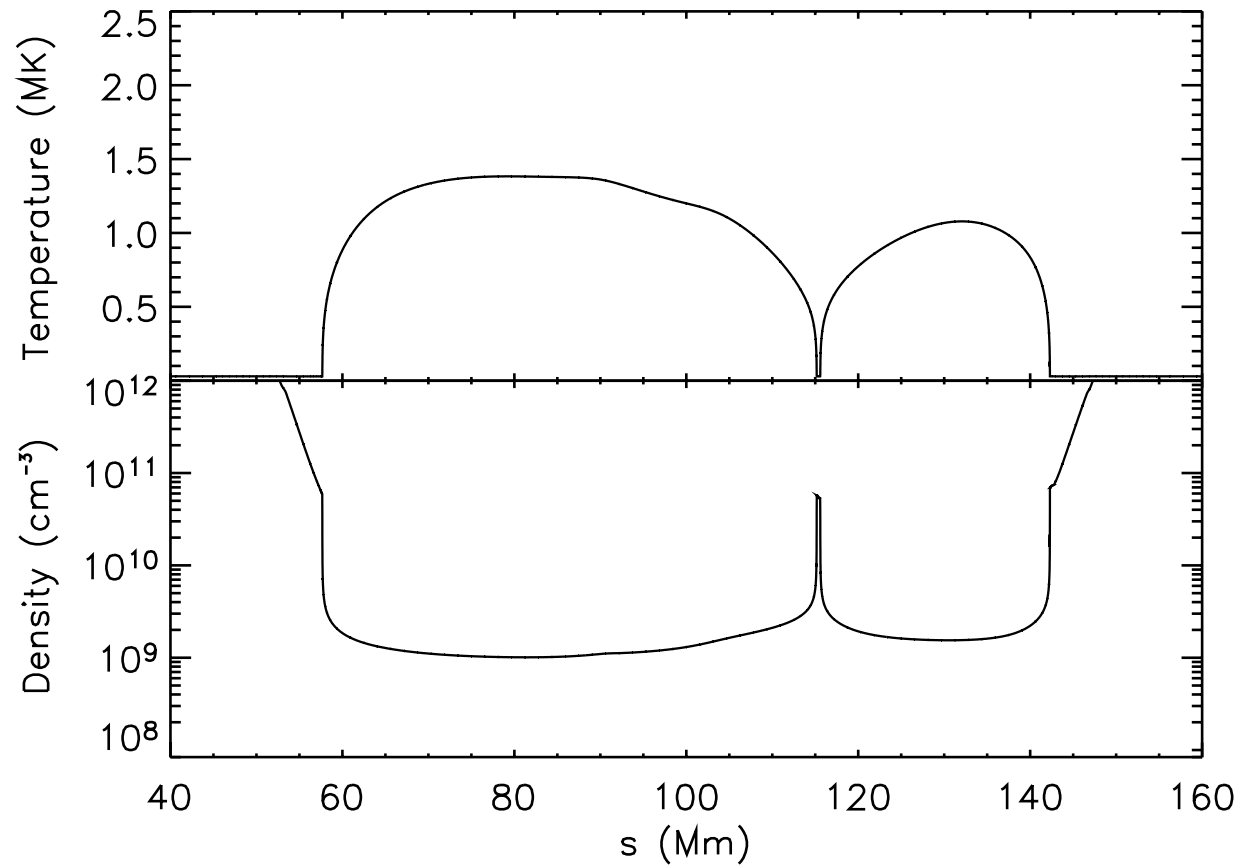
- 1-D HD simulation of multi-stranded loops
- Flux tube of 80 Mm
- Loop initially steady
  - uniform heating:  $E = 2 \times 10^{-5} \text{ erg cm}^{-3} \text{ s}^{-1}$
  - $T_{\text{apex}} = 0.75 \text{ MK}$
- At  $t=0$ :
  - uniform heating off
  - different asymmetric heating regimes on:
    - Spatially: localised or quasi-uniform
    - Temporally: steady or impulsive (cadence  $t_{\text{cool}}/4 - 2 t_{\text{cool}}$ )

details in Susino+2010

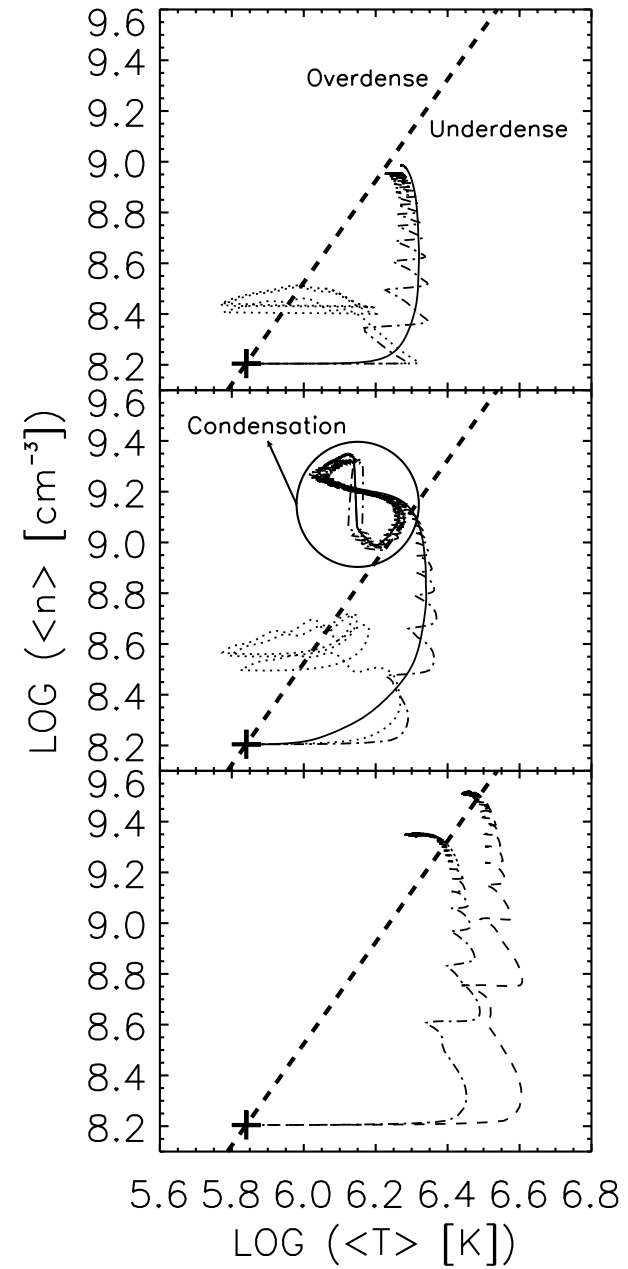
# Plasma dynamics



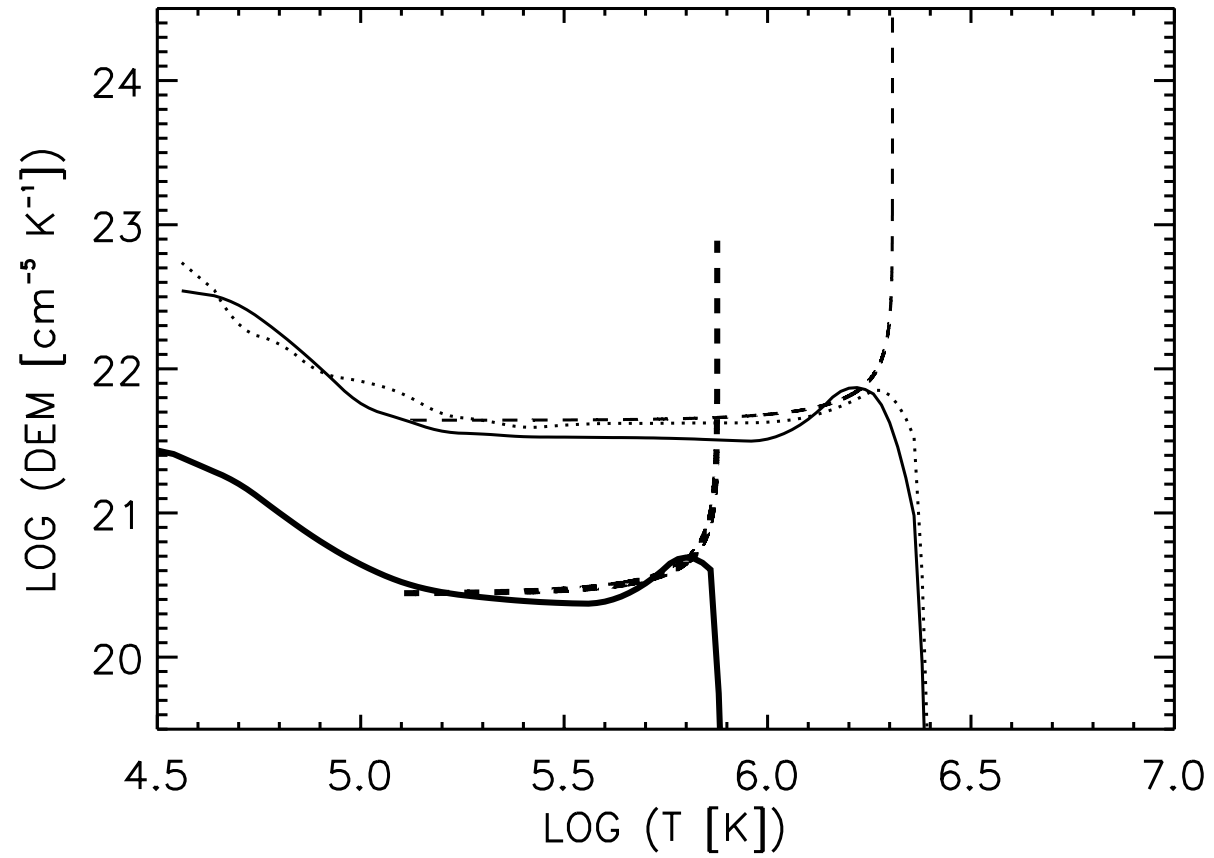
# Condensation



# Loop evolution

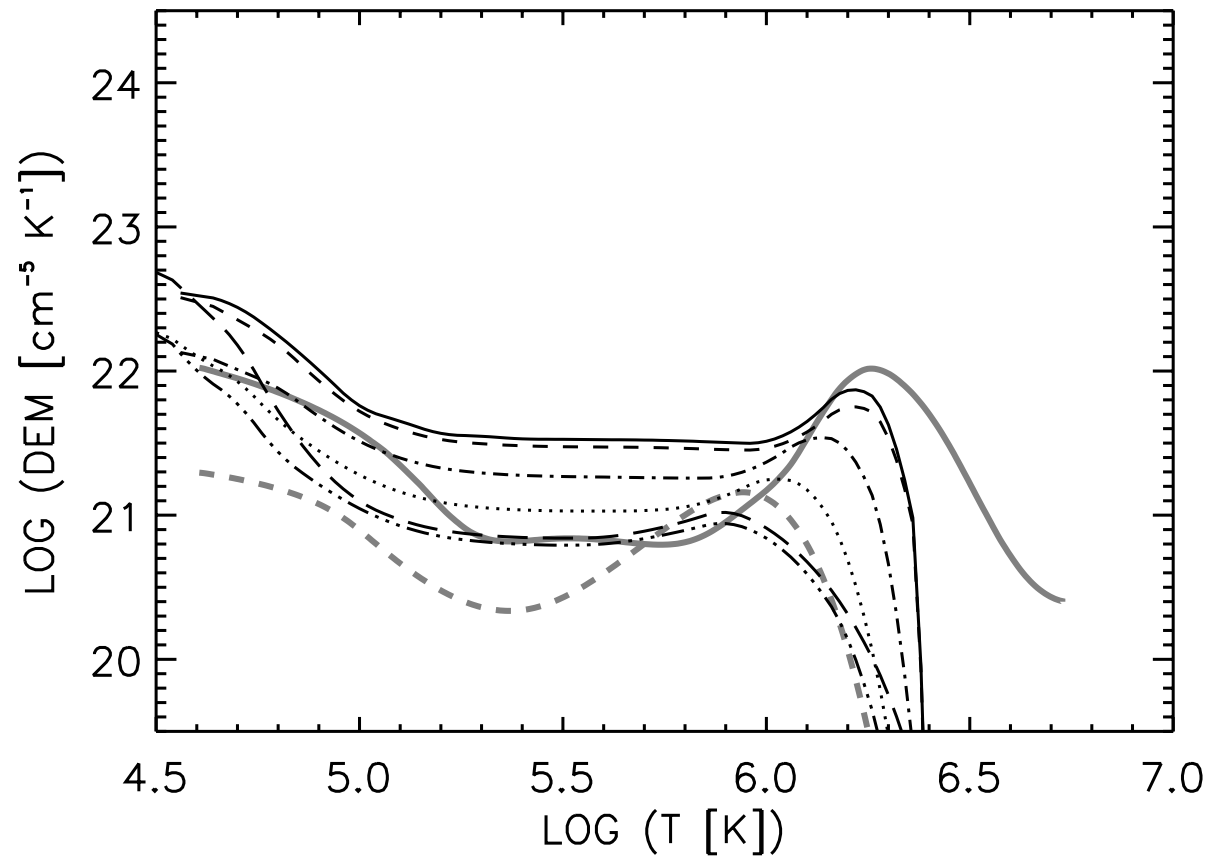


# Initial DEM

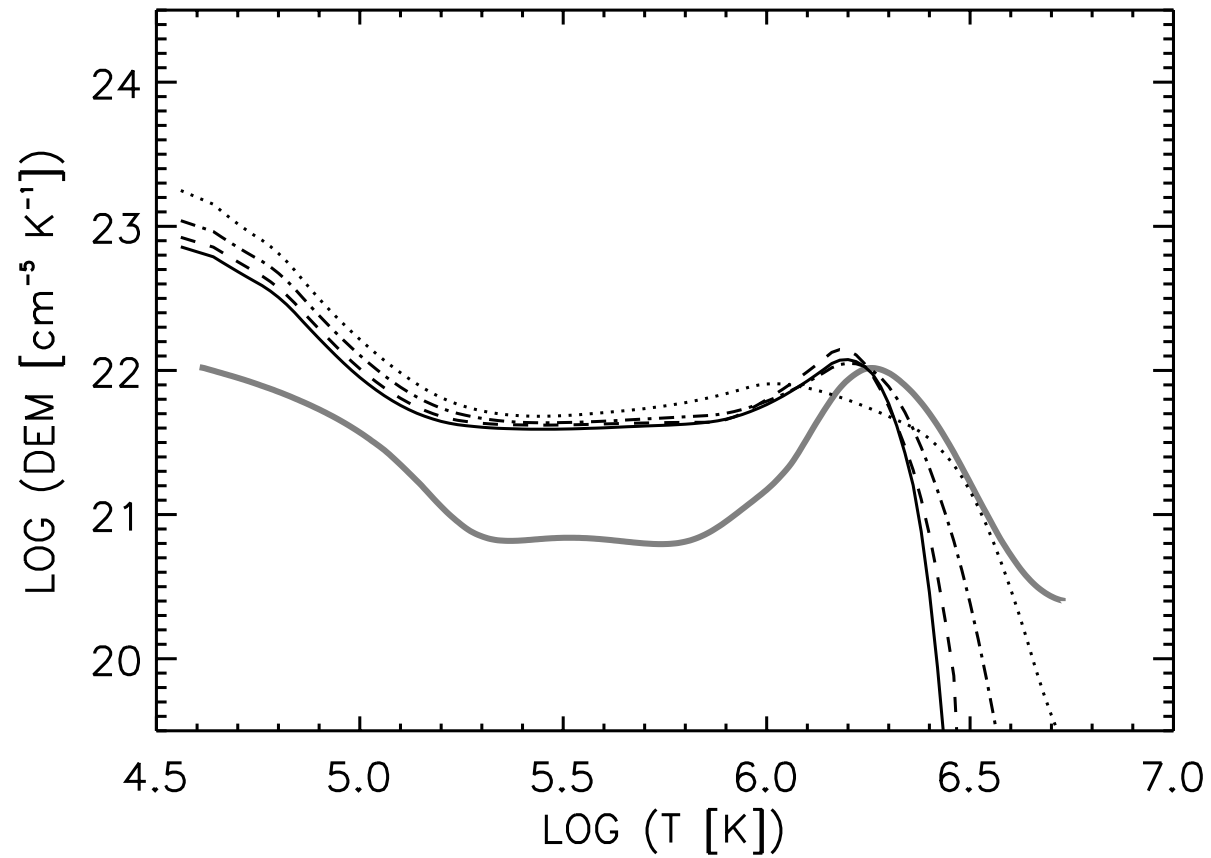




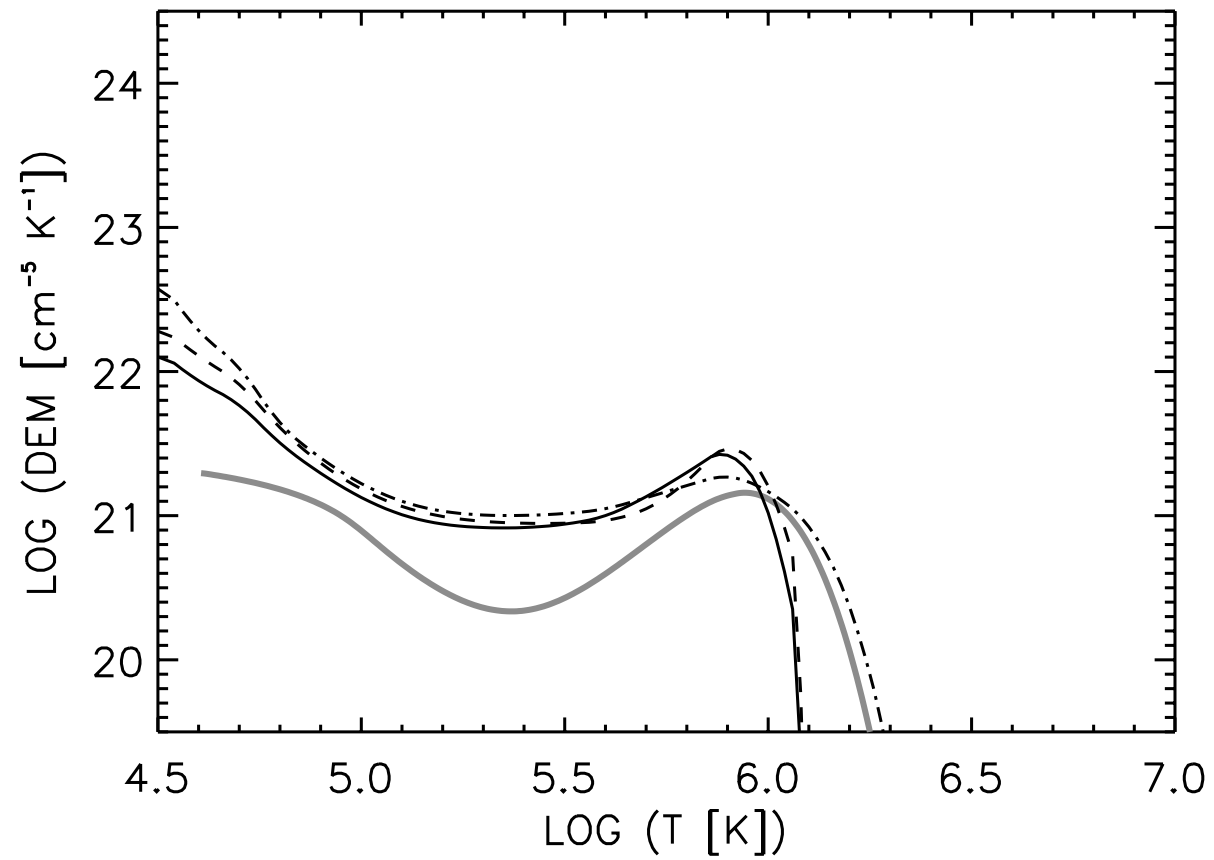
# Quasi-uniform impulsive heating



# Localised impulsive heating



# Quiet Sun



# Conclusions

- Difficulties in reproducing the TR (always)
- $t_c \approx t_{\text{cool}}/4$  case indistinguishable from steady
- Condensation only for a limited combination of E and  $t_c$
- DEM is insensitive to condensation!
  - Plasma distribution similar to the steady case
- Long cadence smears the DEM profile → Quiet Sun
- AR heating due to more frequent pulses than in QS (less smearing of the DEM)
- Comparable energy of the single pulse in AR and QS.