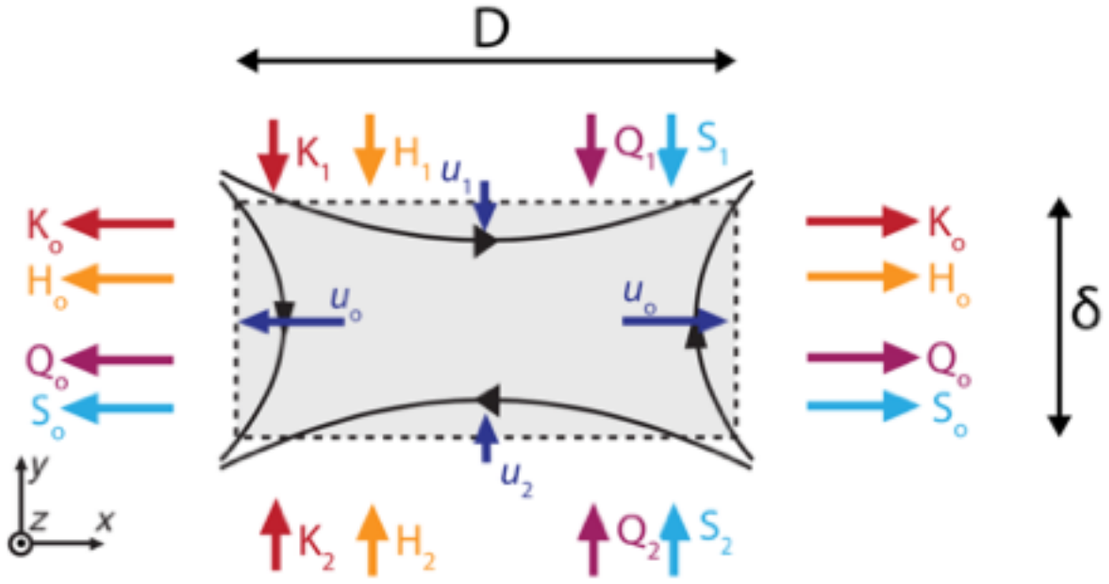
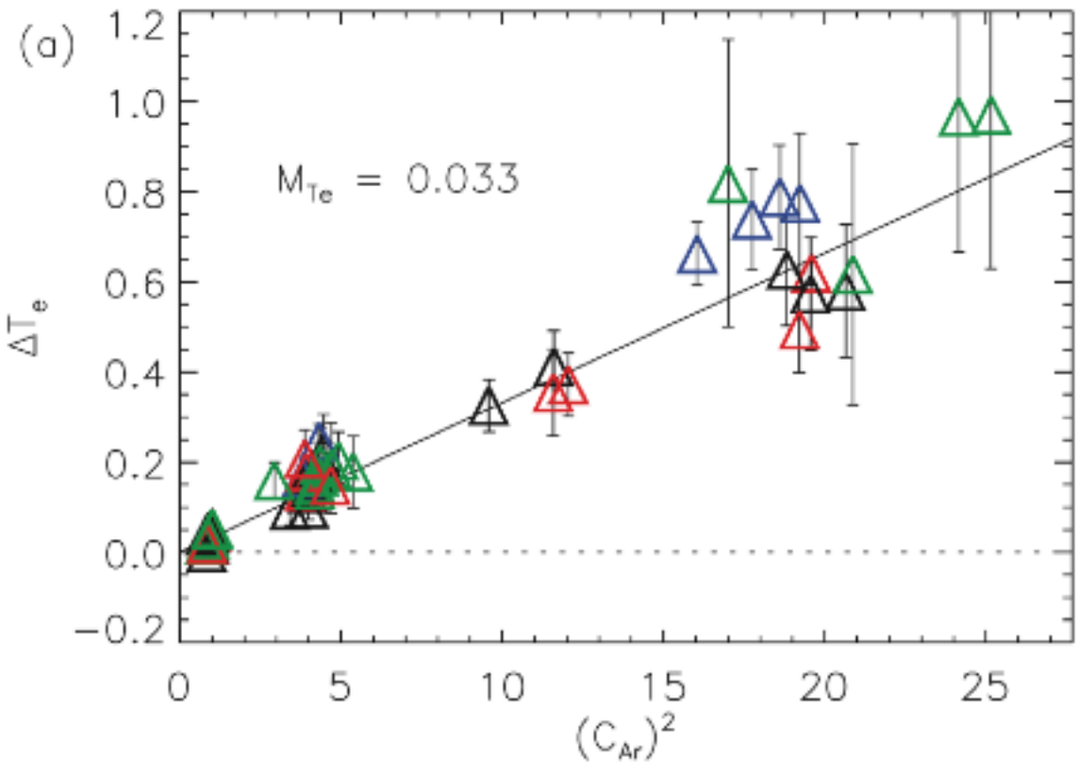
How much are electrons heated during reconnection?

PIC simulations and observations of magnetic reconnection suggest that a constant fraction of inflowing magnetic energy is given to electrons



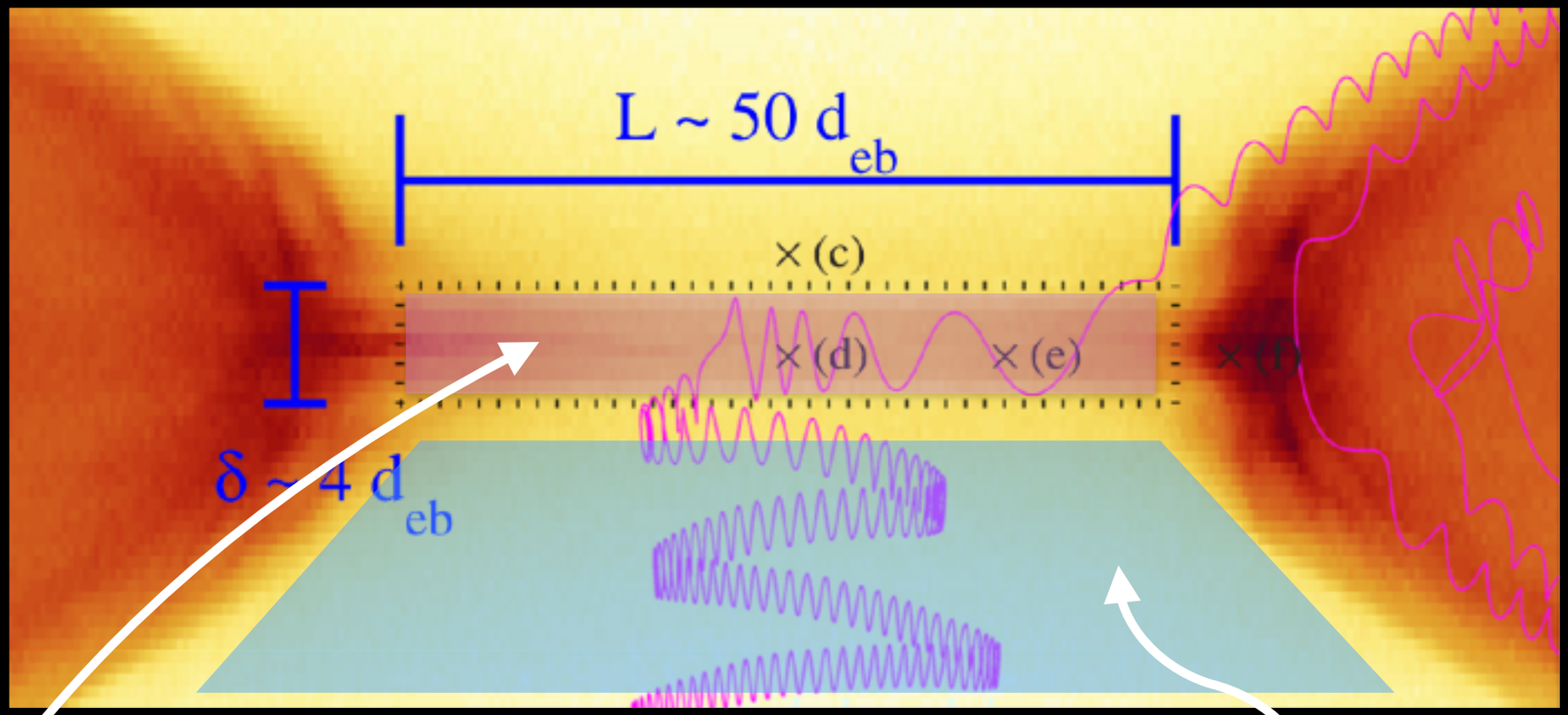
$$M_{Te} = \frac{k_B T_{e,out} - k_B T_{e,in}}{m_i v_A^2}$$



(Drake et al., 2014)

This fraction M_{Te} is remarkably independent of plasma parameters in the inflowing region

A model for the heating mechanism exists



Diffusion region

Inflow

$$\Delta T_{e,diff} \simeq T_{e,up} \frac{C}{\beta_{e,up}} \sqrt{\frac{m_e}{m_i}}$$

$\Delta T_{e,in}$