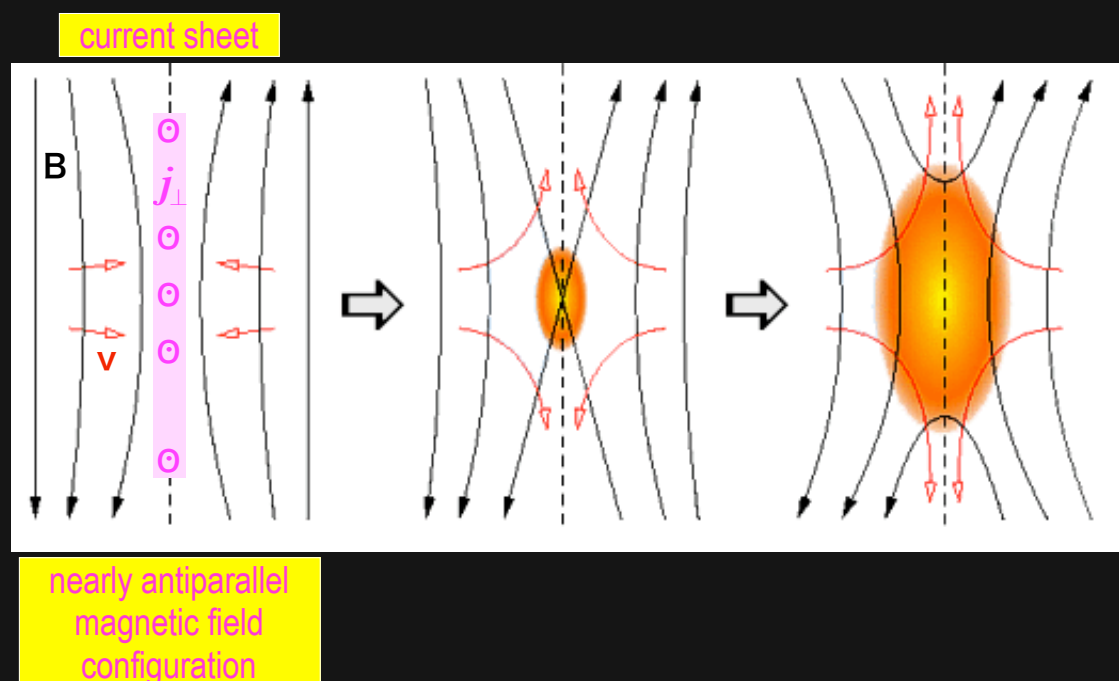


Diffusion of magnetic fields in the solar atmosphere

Magnetic reconnection

Nearly antiparallel magnetic field configuration associated with cross-field current j_{\perp}

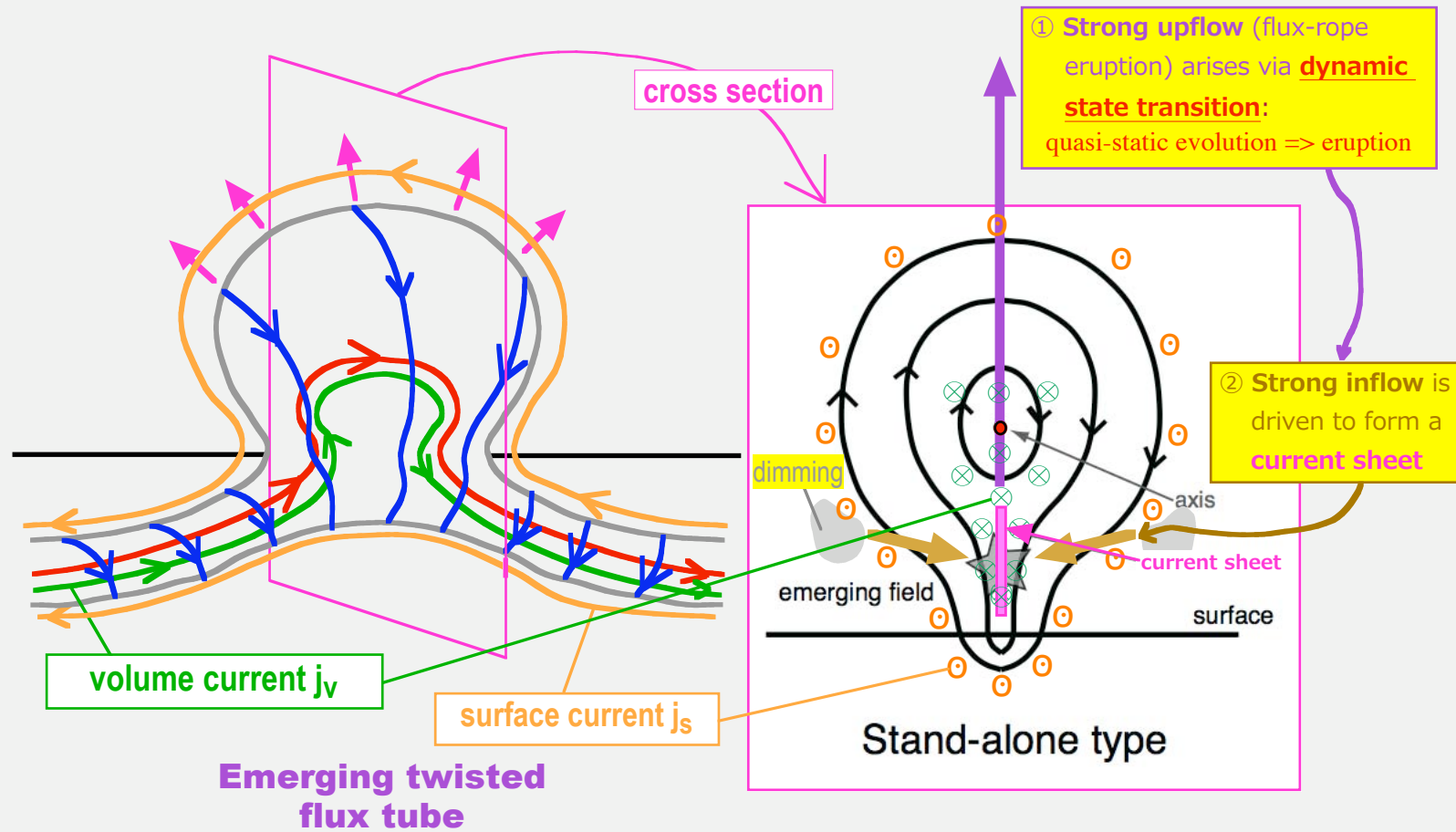
=> current sheet



In the **current sheet**, energy conversion called '**magnetic reconnection**' may proceed, which **efficiently converts free magnetic energy to kinetic and thermal energy**. It may also **accelerate selected particles via electric field involved in the reconnection**.

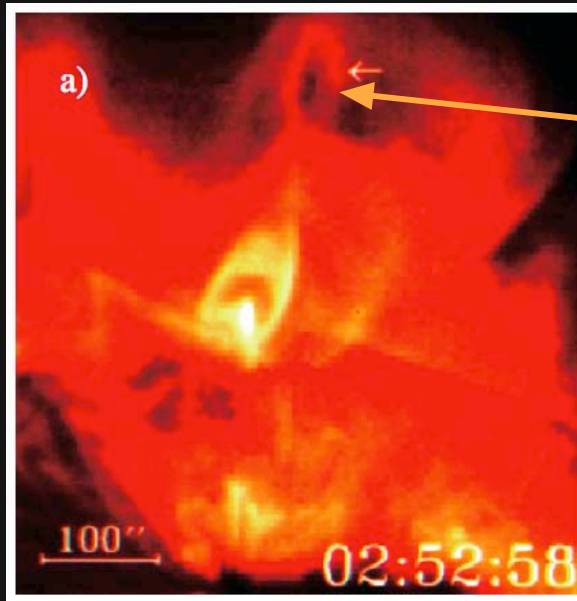
How does a current sheet form in an emerging twisted flux tube?

Relevant processes (http://163.180.179.74/~magara/page31/Research_evolution-path.html)

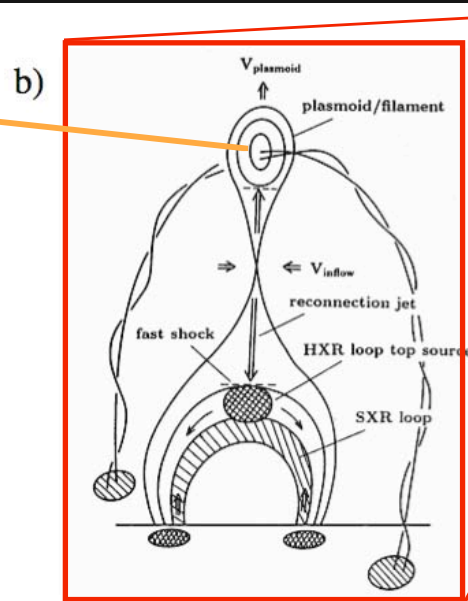


Energy release in the current sheet (flare)

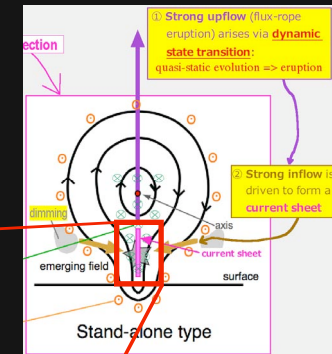
Structure of a flare



Observed by *Yohkoh*



Shibata (1999)



Statistical properties of flares

Spatial size: $10^4 - 10^5$ km

Duration: $10^3 - 10^4$ sec

Released energy: $10^{28} - 10^{32}$ erg/event $\longleftrightarrow L_o \sim 4 \times 10^{33}$ erg/s