

ASTROPHYSICAL RECONNECTION

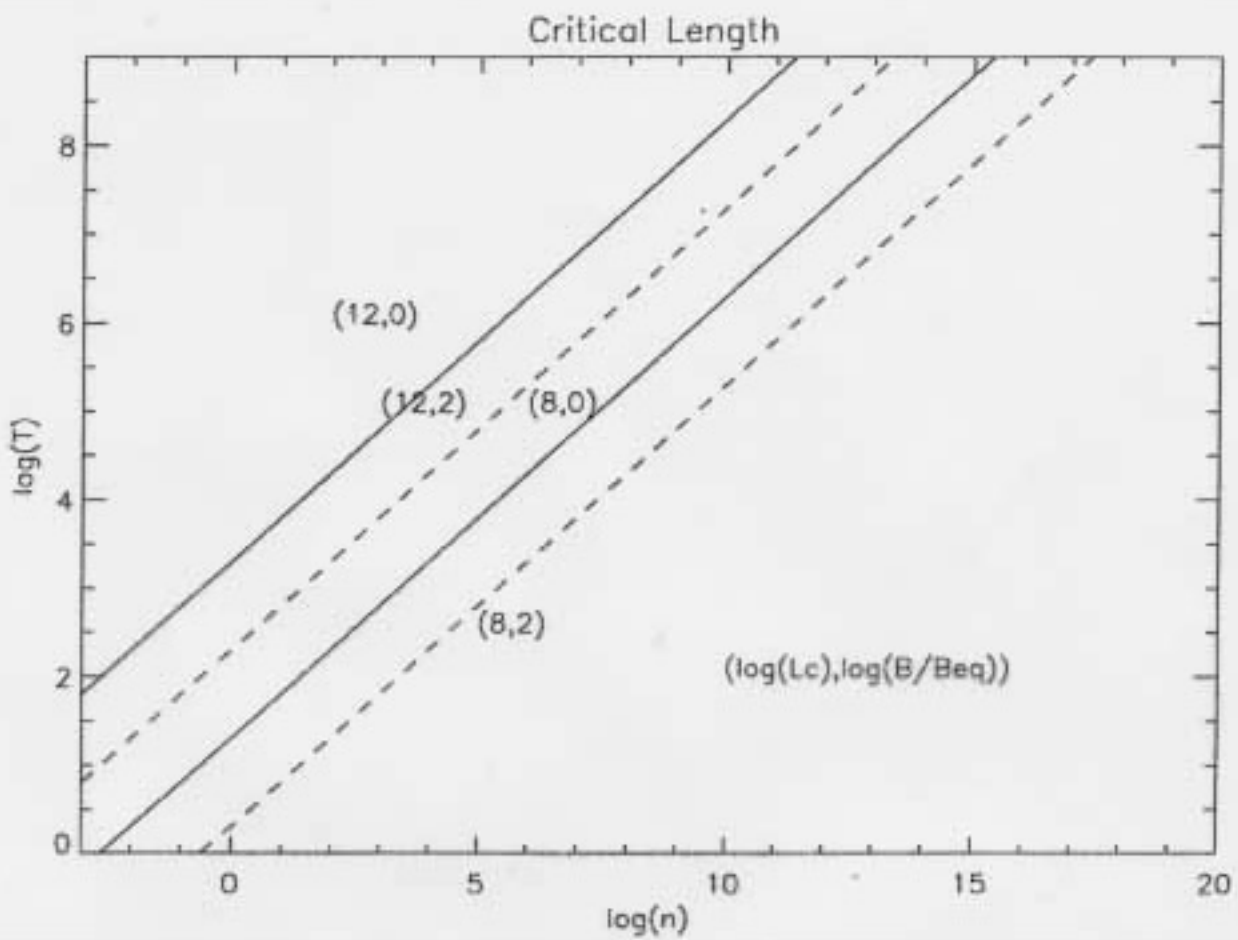
- ENORMOUS DISPARITY OF SCALES
- NOVEL SPECIES
 - NEUTRALS
 - CHARGED DUST
 - COSMIC RAYS
 - POSITRONS
 - PHOTONS
- LINE-TIED & APERIODIC BOUNDARY CONDITIONS
- STRONG FLUID DRIVING

COLLISIONLESS OR COLLISIONAL ?

$$\frac{\delta_{sp}}{\delta_i} = \left(\frac{L}{\delta_i}\right)^{1/2} \frac{1}{(\omega_{ce} \tau_e)^{1/2}}$$

ANSATZ: COLLISIONLESS RECONNECTION IF $\frac{\delta_{sp}}{\delta_i} < 1$

THIS IS PLOTTED FOR A HYDROGEN PLASMA w B IN UNITS OF $B_{eq} \equiv (8\pi P)^{1/2}$



HOW THE MICROSCOPIC AFFECTS THE MACROSCOPIC:



GALSCHAARD &

NORDLUND

LU'S
HAMILTON
1991

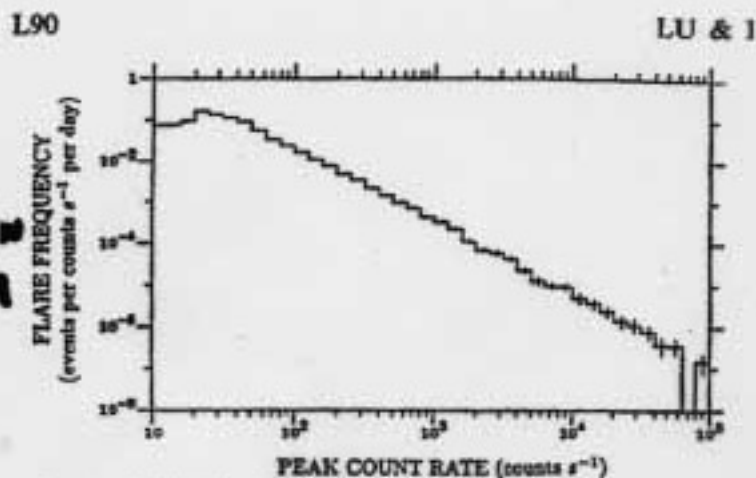


FIG. 1.—Distribution of flare occurrence rate vs. peak count rate for all flares detected with the Hard X-Ray Burst Spectrometer (figure provided by B. R. Dennis). The distribution has logarithmic slope 1.8.

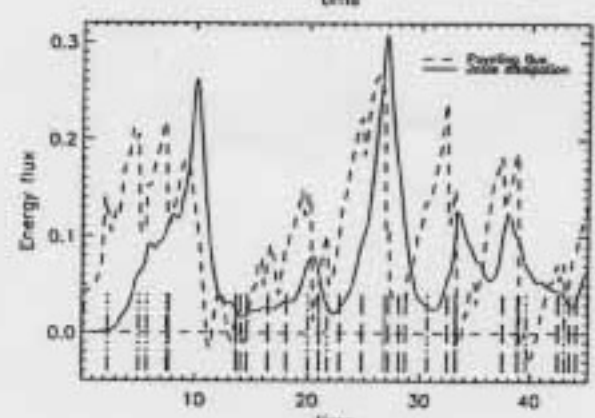
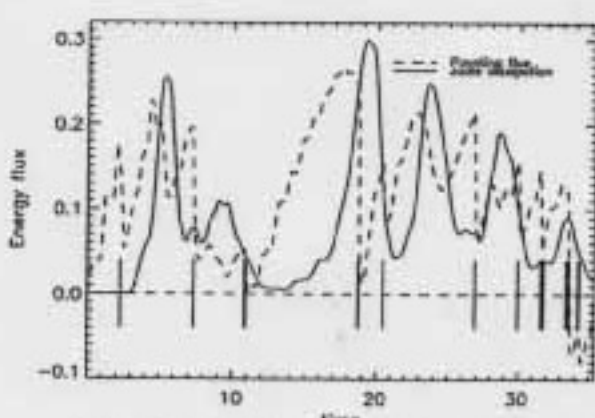


Figure 3. The average Poynting flux and the average Joule dissipation for run # 1 and # 2. The vertical lines indicate the times when the boundary shearing patterns were changed. Time is measured in units of L_y/V_A .

SOLAR FLARE TRIGGER?

WORK DONE ON CORONAL FIELD BY FOOTPOINT MOTIONS