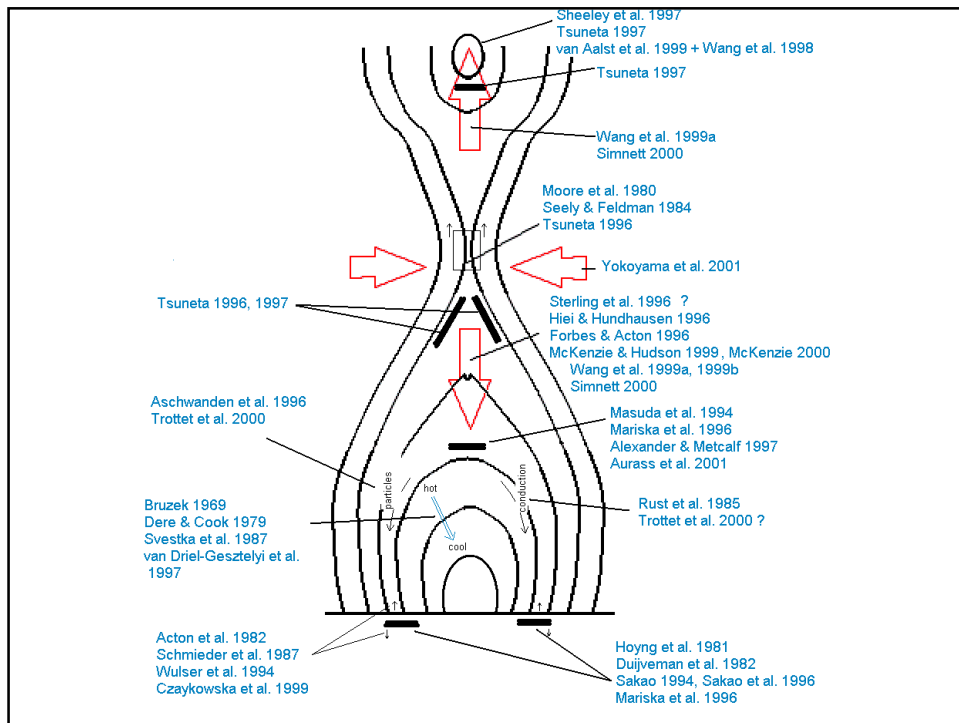
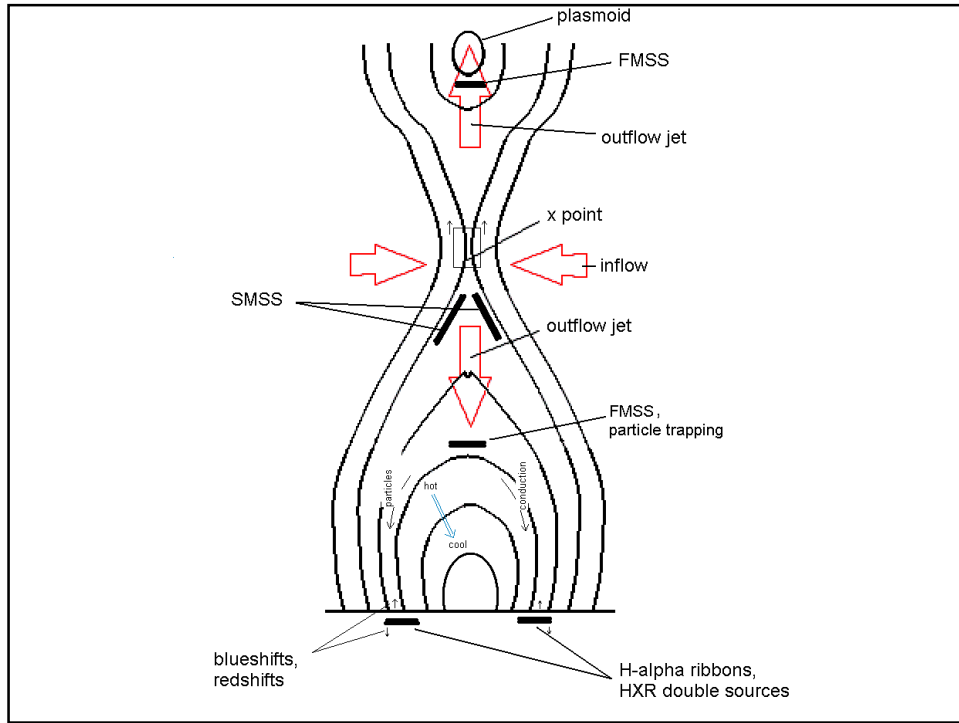
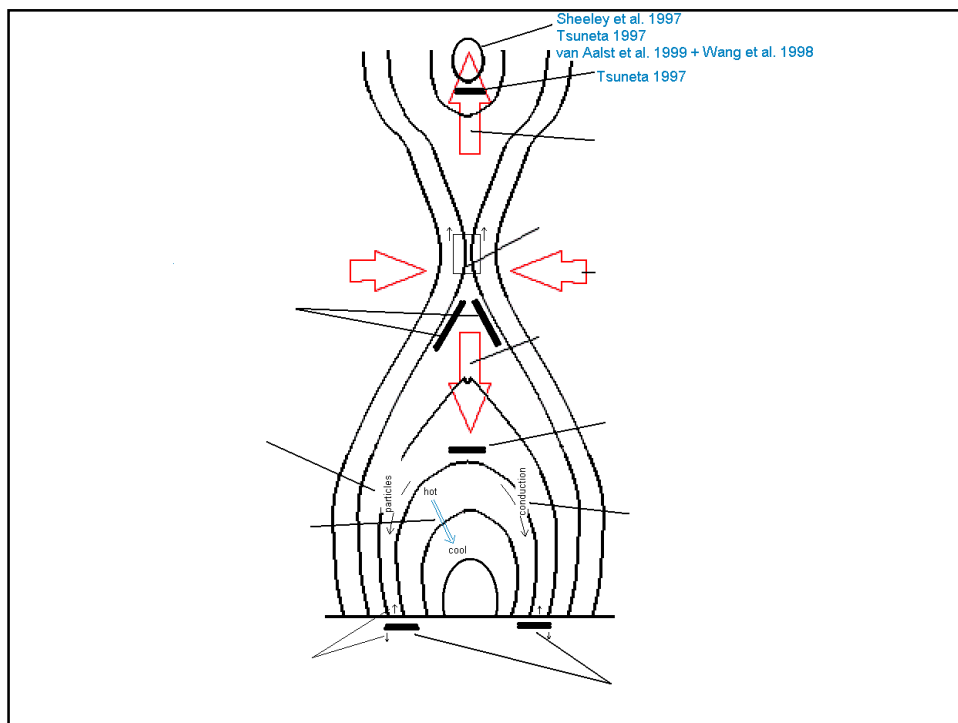
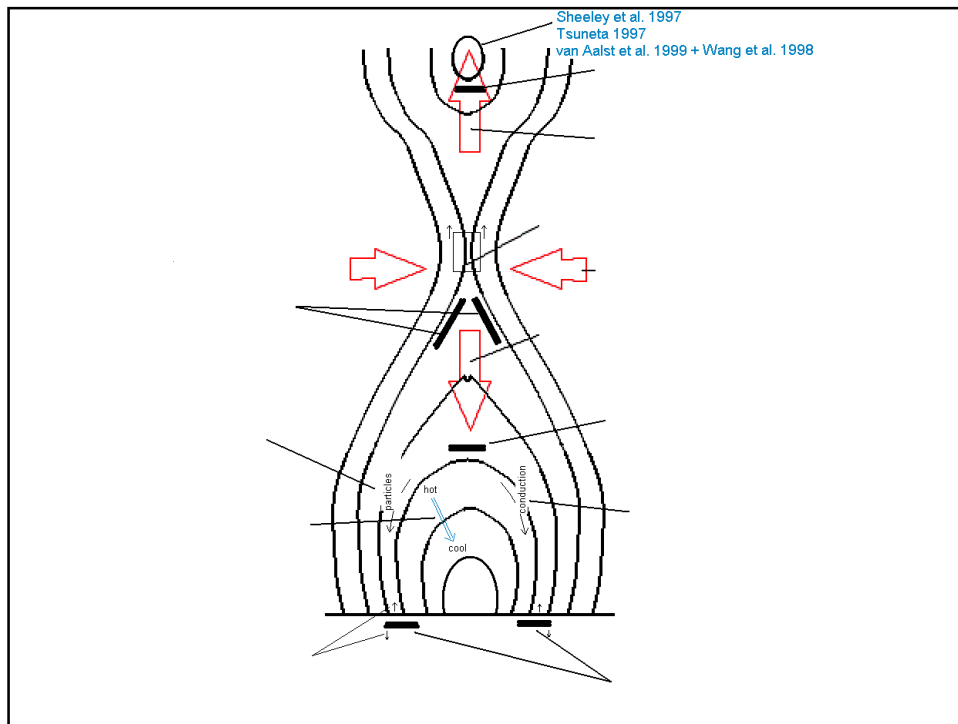


# Reconnection observed: 2d and 3d elements



Reconnection observed: 2d and 3d elements



Tsuneta (1997) : fast-mode shock?

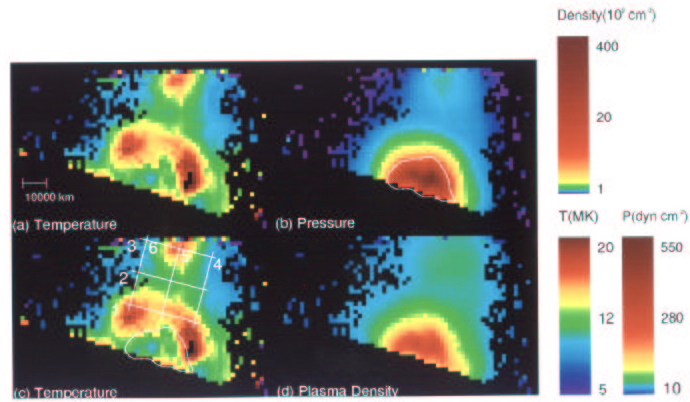
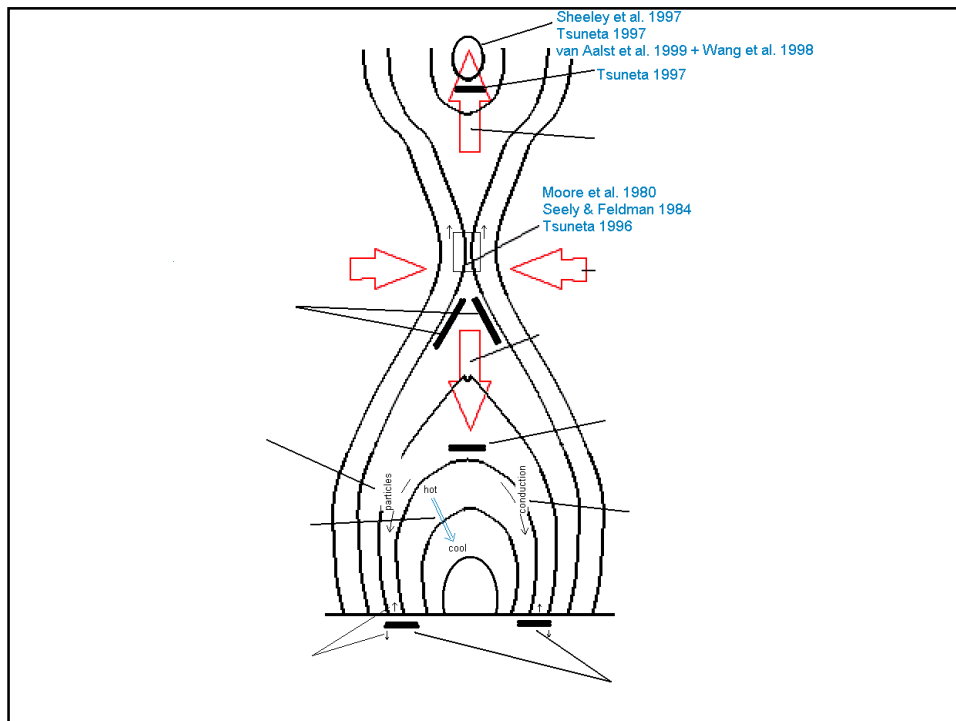


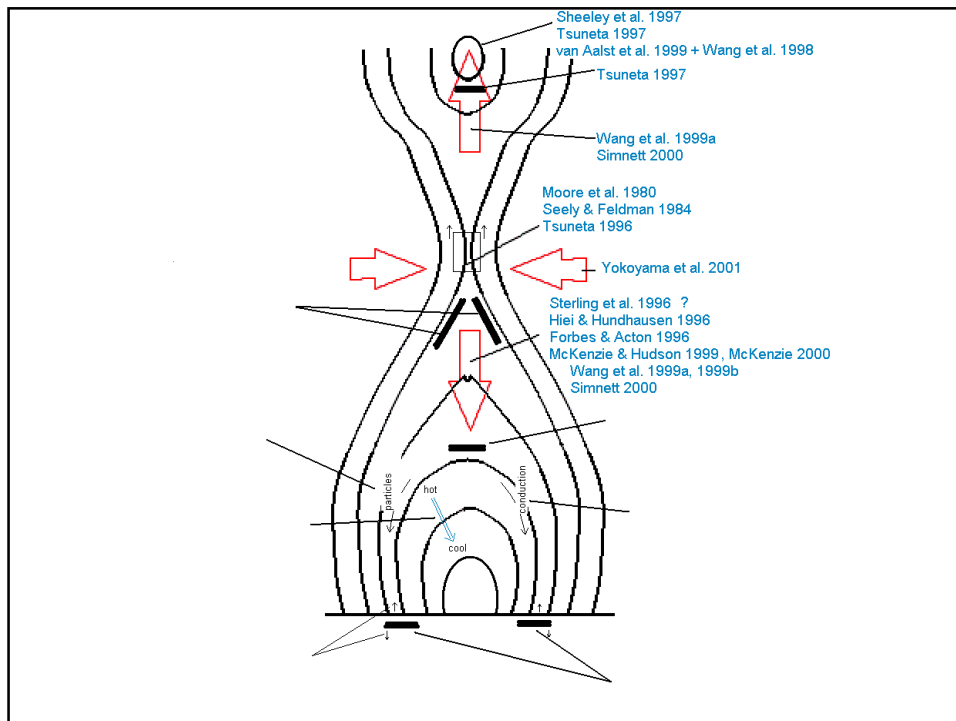
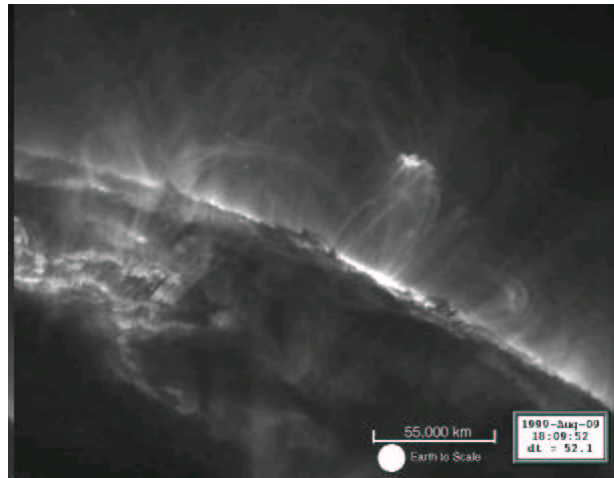
FIG. 6.— Enlarged map of Fig. 4 (b): (a) Temperature, (b) Pressure, (c) Temperature (same as [a]), (d) Plasma density. The temperature, pressure, and density profiles along the lines indicated are shown in Fig. 7. (d) Plasma density.

TSUNETA (2004B, 53)



Reconnection observed: 2d and 3d elements

One example from TRACE



Simnett (2000)

- Upflow at 260 km/s. Wang et al., 150-300 km/s.
- Downflow at 120 km/s. Wang et al., 20-100 km/s, *decelerating*.

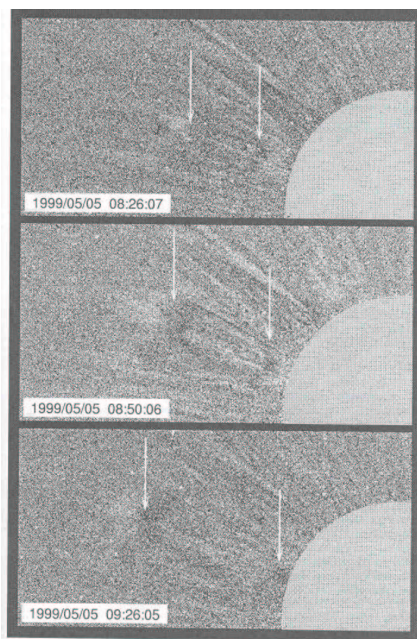
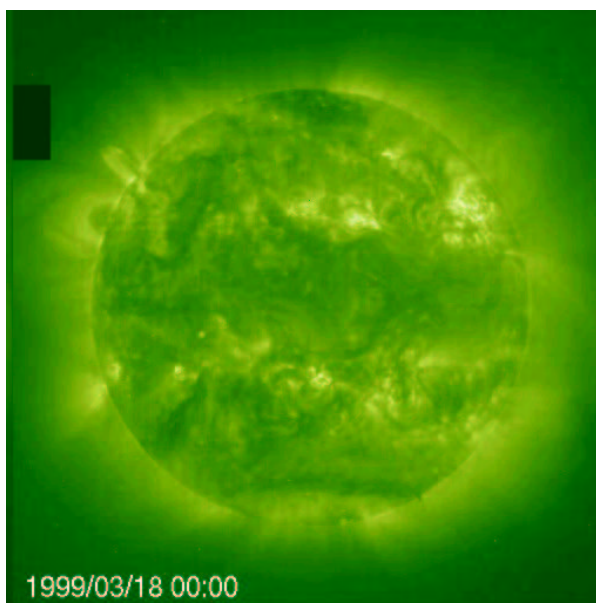
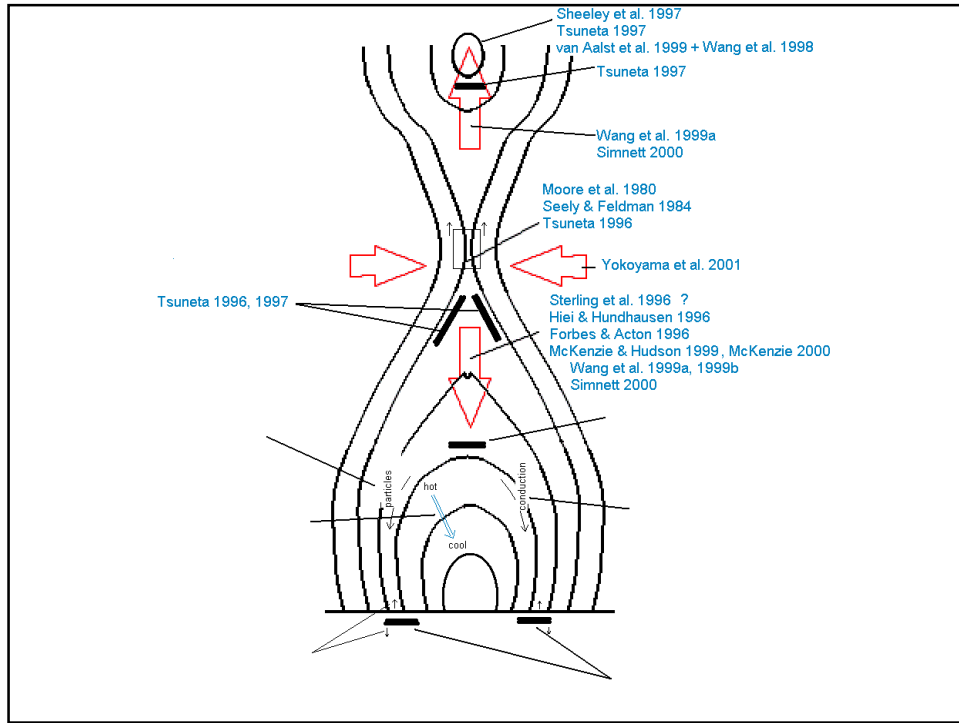


Figure 4. Running difference images of the bi-directional mass flow seen in the corona on 5 May 1999.

Yokoyama et al. (2001)



Reconnection observed: 2d and 3d elements



Tsuneta (1997) : slow-mode shock heating

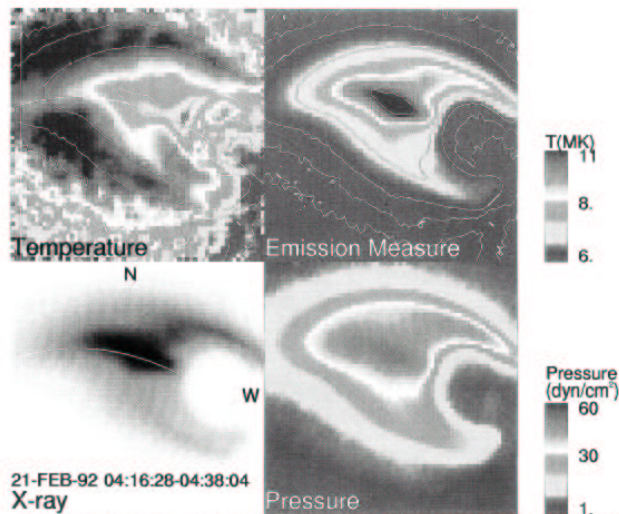
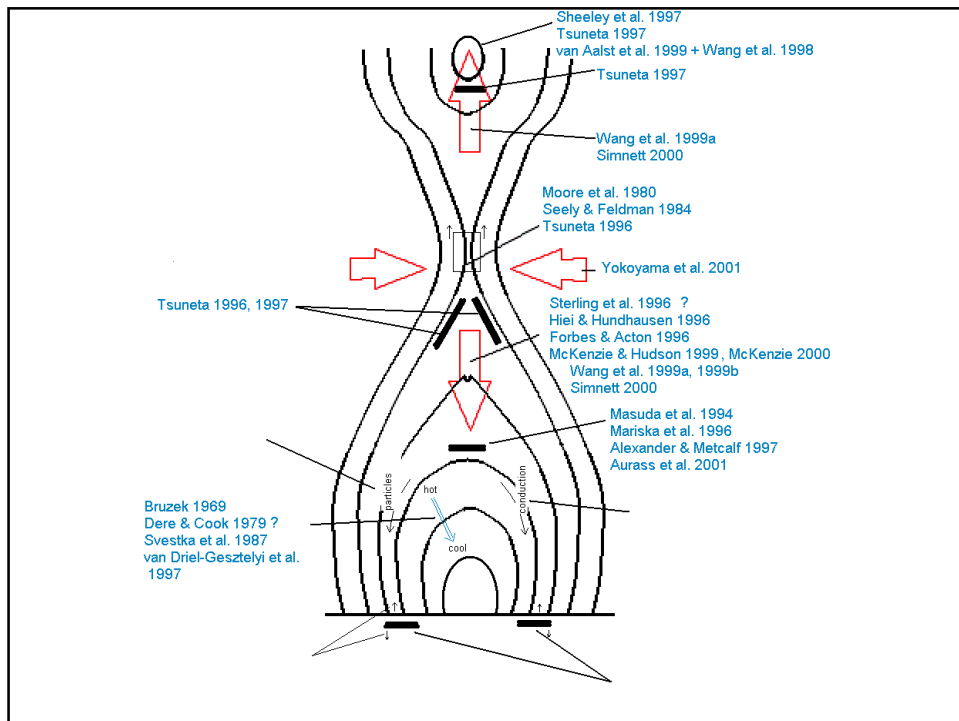
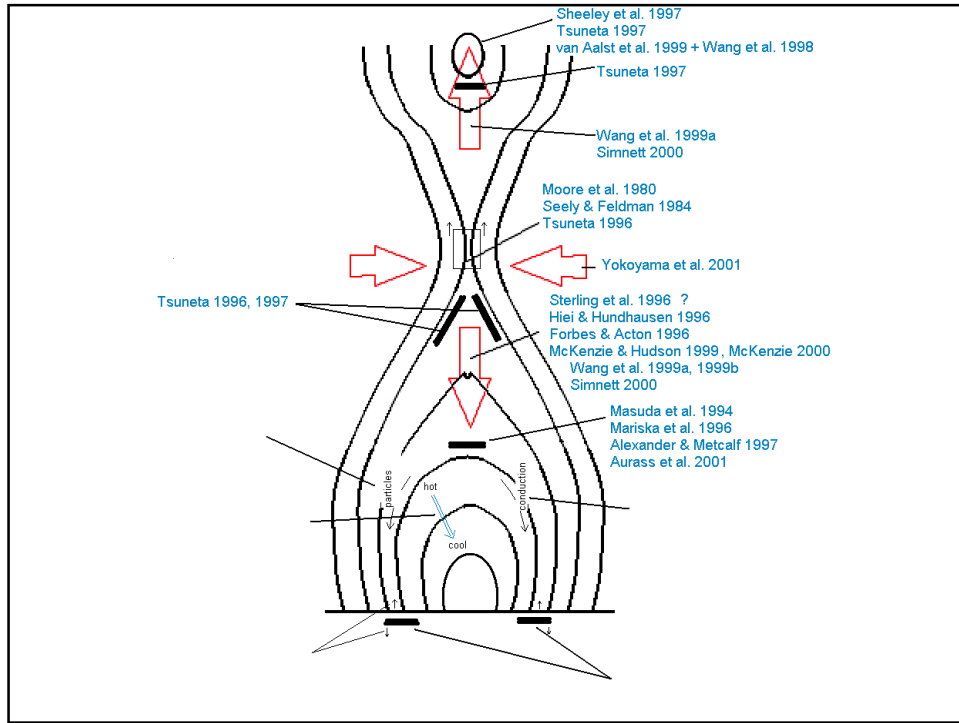


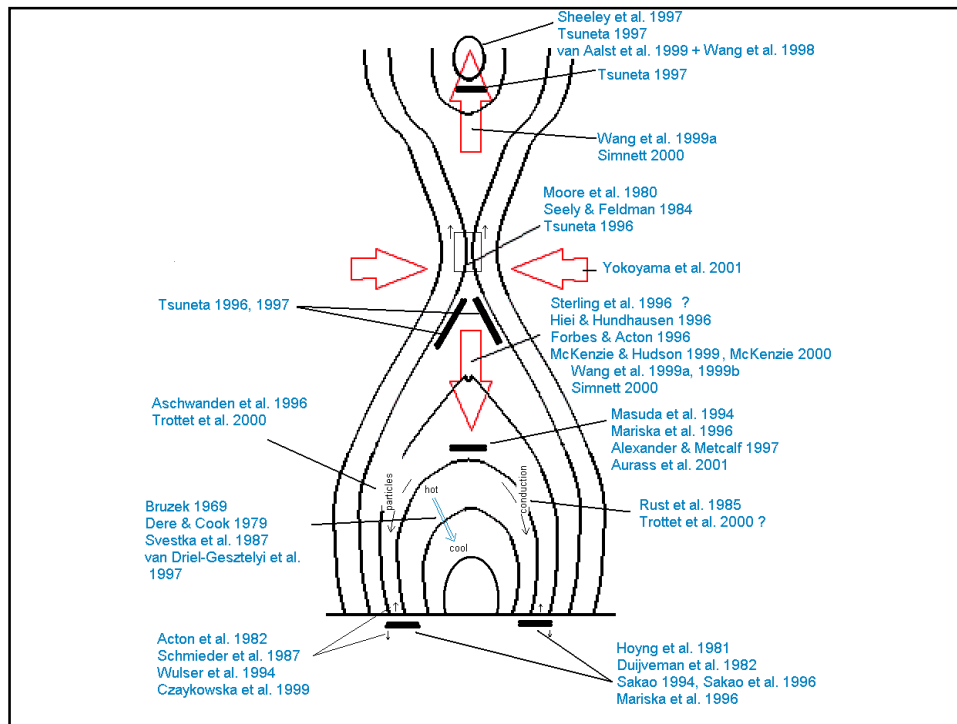
FIG. 3.—Temperature, emission measure, pressure, and X-ray (thick aluminum filter) maps of the 1993 February 21 flare. The flare occurred on the east limb (N05, E90). North is up, and east is to the left. The contours in the temperature and emission measure maps indicate the locations of 95%, 20%, 5%, 2%, and 1% levels of the peak X-ray intensity of the map. The size of the FOV is 2.4, and the pixel size is 2'–4". The data taken from 4:16 to 4:38 UT, early-dense phase in soft X-rays, are summed to obtain the high-quality temperature maps for the low-intensity region outside the flare loop.

Reconnection observed: 2d and 3d elements





## Reconnection observed: 2d and 3d elements



## Obs2questions: plasma parameters

1. Outflows: Measured and slow.

Downflows: Wang et al. (20-100 km/s, decelerating);  
 Simnett (118 km/s); McKenzie & Hudson (40-500 km/s)  
 Sub-Alfvénic? (*downstream conditions*) Or, what is  $v_A$ ?  
 (*upstream conditions*) Or, interaction with return current?  
 (*sheet conditions*)

Upflows: Wang et al. (150-300 km/s); Simnett (260  
 km/s); (*high-altitude conditions*)

### Obs2questions: plasma parameters

2. Inflows: Measured. Fast? Slow?

Yokoyama et al. (1-5 km/s) suggests Petschek reconnection, though imprecise ( $M_A = 0.001\text{—}0.03$ ). May constrain plasma parameters if more observations can be acquired. Also suggests slower  $v_A$  (160-970 km/s).

### Obs2questions: plasma parameters

3. FMSS: Observed?

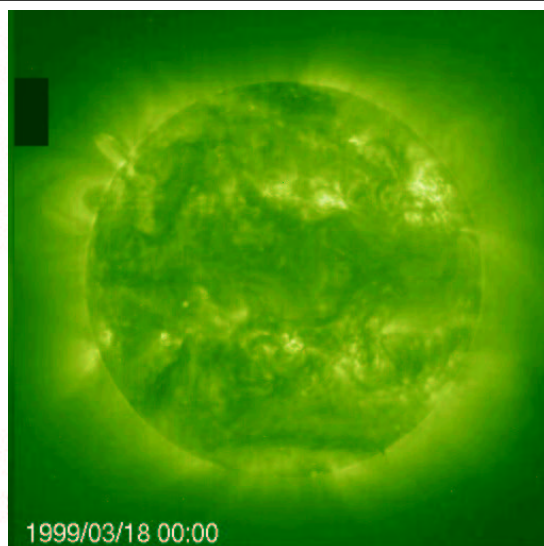
Tsuneta; Aurass et al. – Rare visibility describes  $v_A$ ,  $\beta_P$  (*upstream, downstream conditions?*). Aurass et al. frequency indicates  $n_e$ , but height must be inferred. Need more obs, but what info can we learn from them?

Obs2questions: dimensionality

Looks like 2-D	Tsuneta; Forbes & Acton; Yokoyama et al.
Looks like 2.5-D	Czaykowska et al.
Looks like 3-D	Svestka et al.; McKenzie; Fletcher et al.

Obs2questions: dimensionality

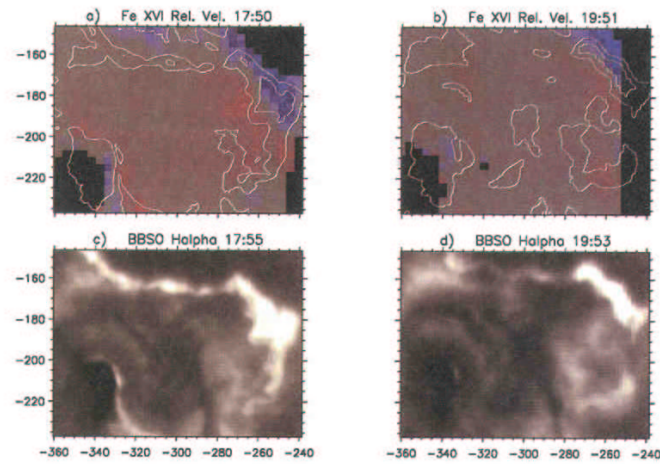
Looks like 2-D	Tsuneta; Forbes & Acton; Yokoyama et al.
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### Obs2questions: dimensionality

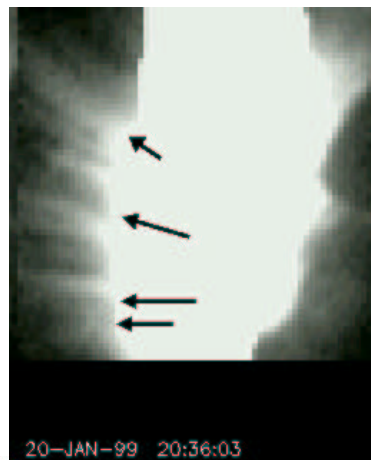
Looks like 2.5-D	Czaykowska et al.
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CZAYKOWSKA ET AL.



### Obs2questions: dimensionality

Looks like 3-D	Svestka et al.; McKenzie; Fletcher et al.
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### Obs2questions: dimensionality

Looks like 3-D	Svestka et al.; McKenzie; Fletcher et al.
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