

Evidence for Interchange Reconnection between Coronal Hole and Emerging Flux Region

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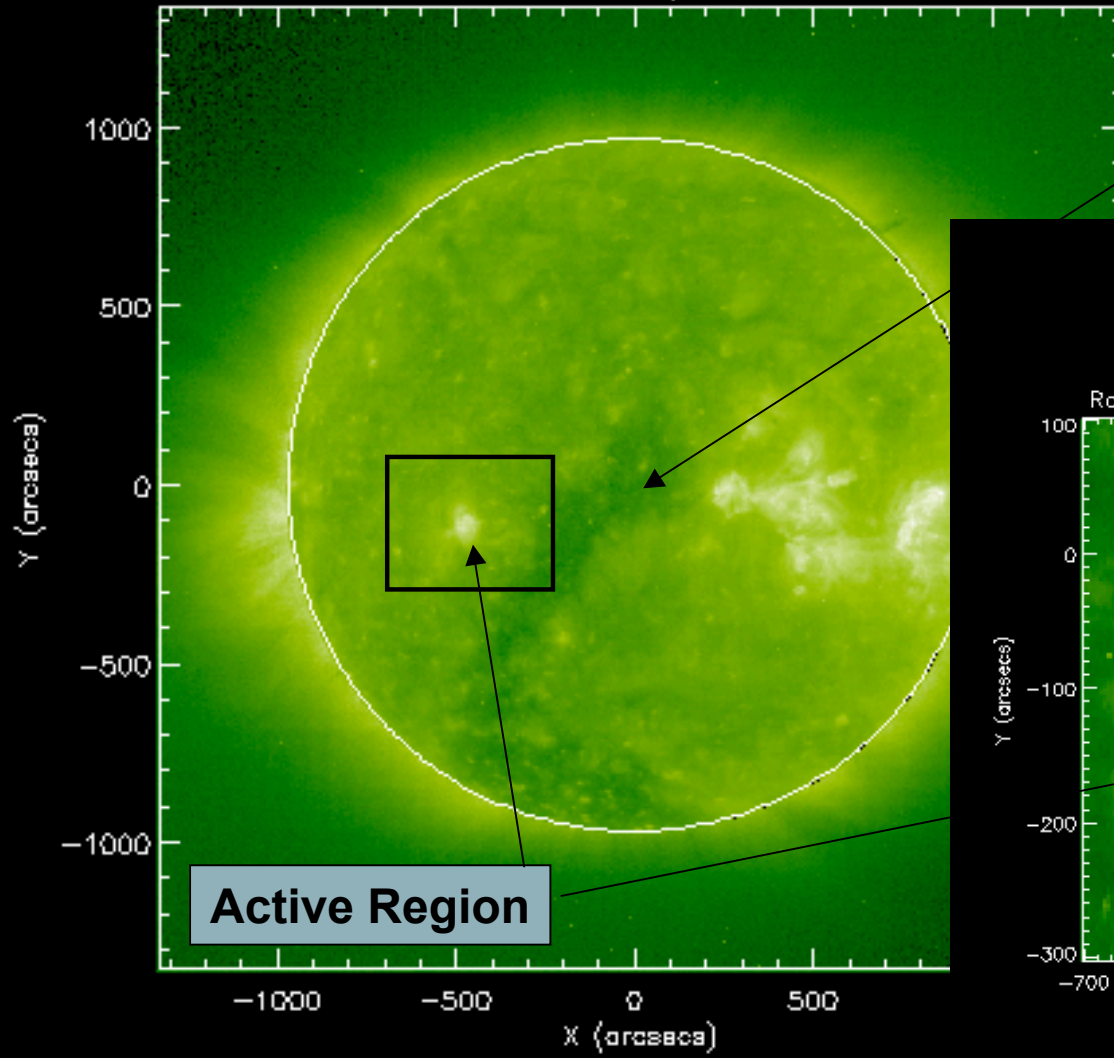
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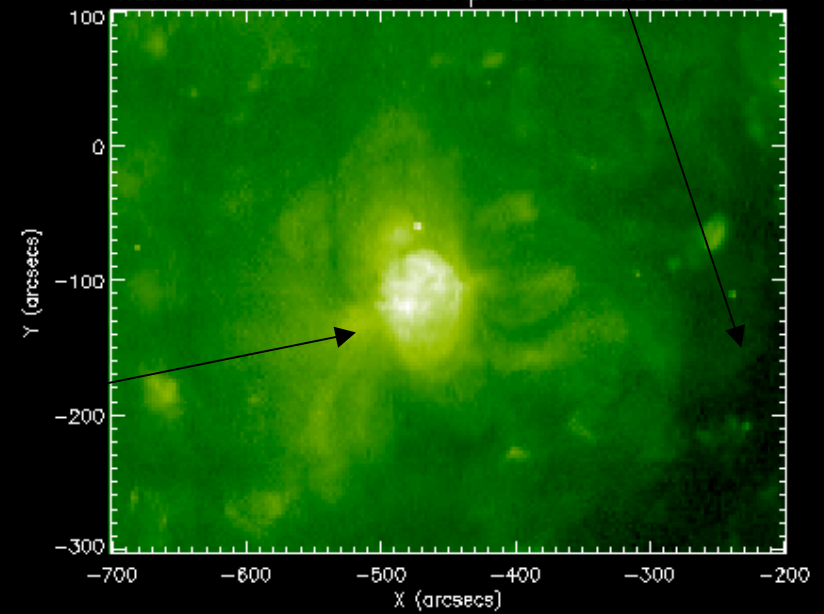
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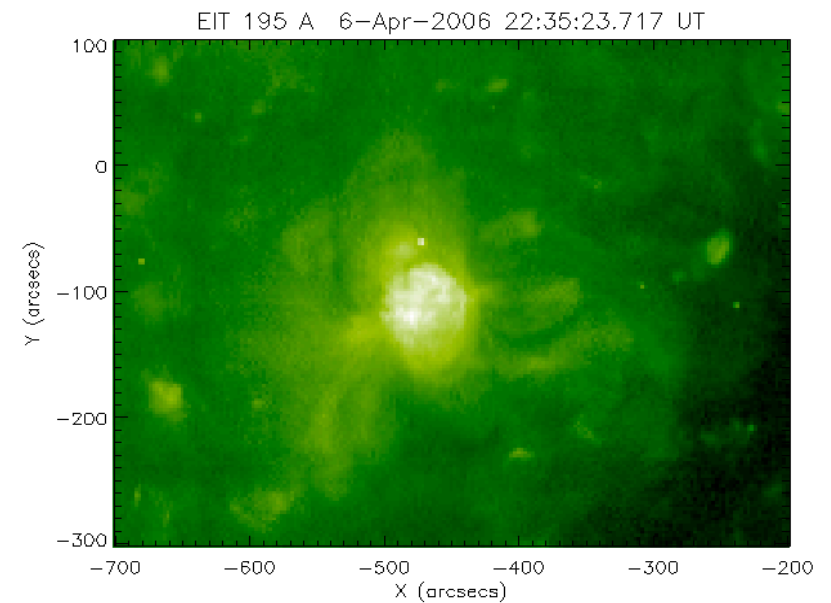
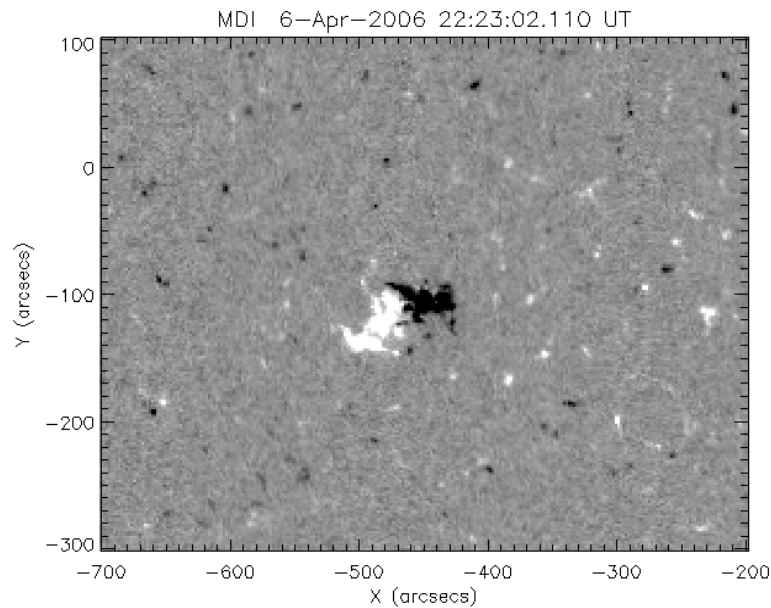
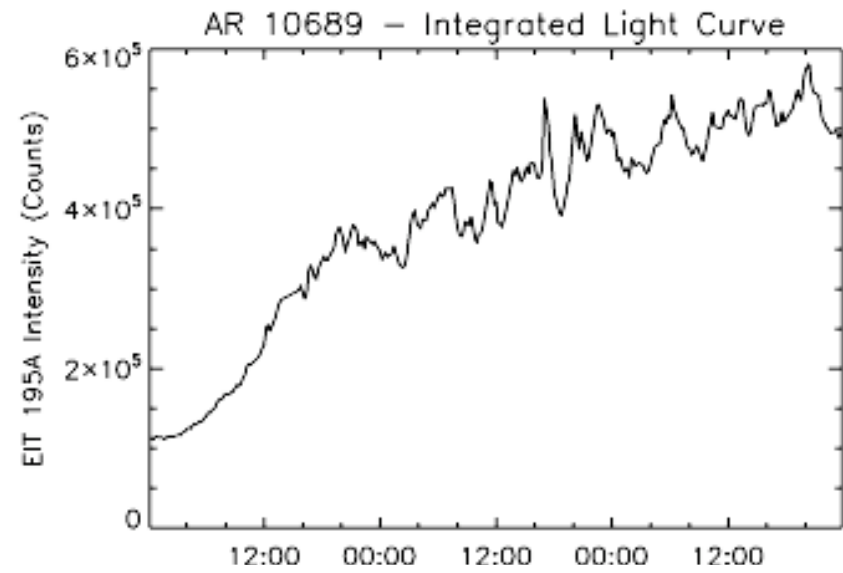
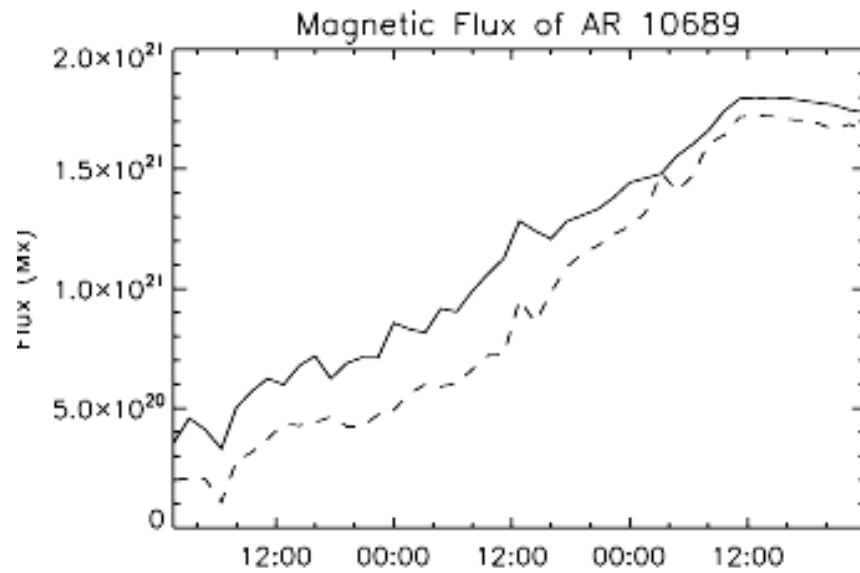


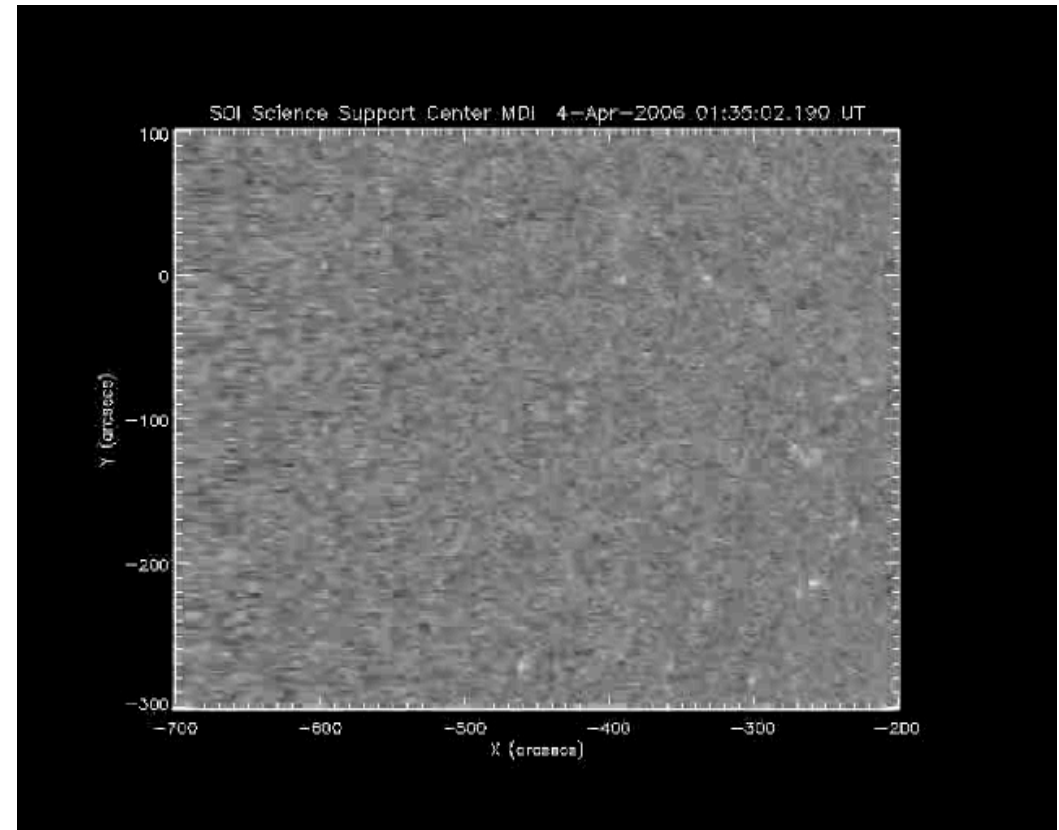
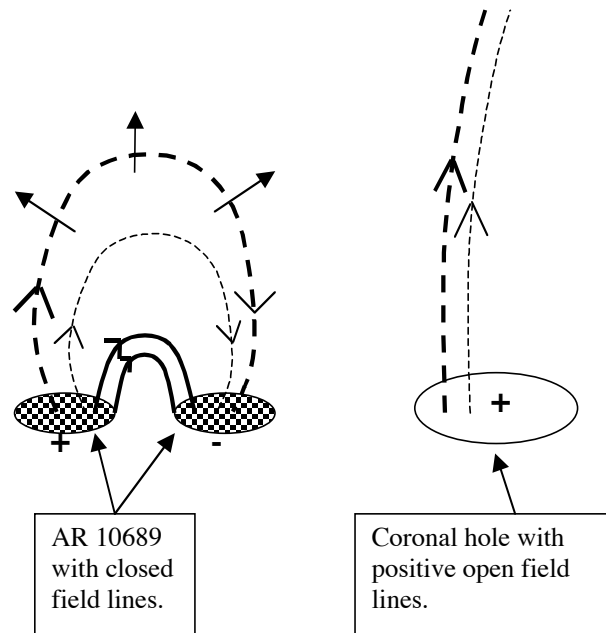
Coronal Hole

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AR 10689 Magnetic Flux and EUV Intensity Evolution

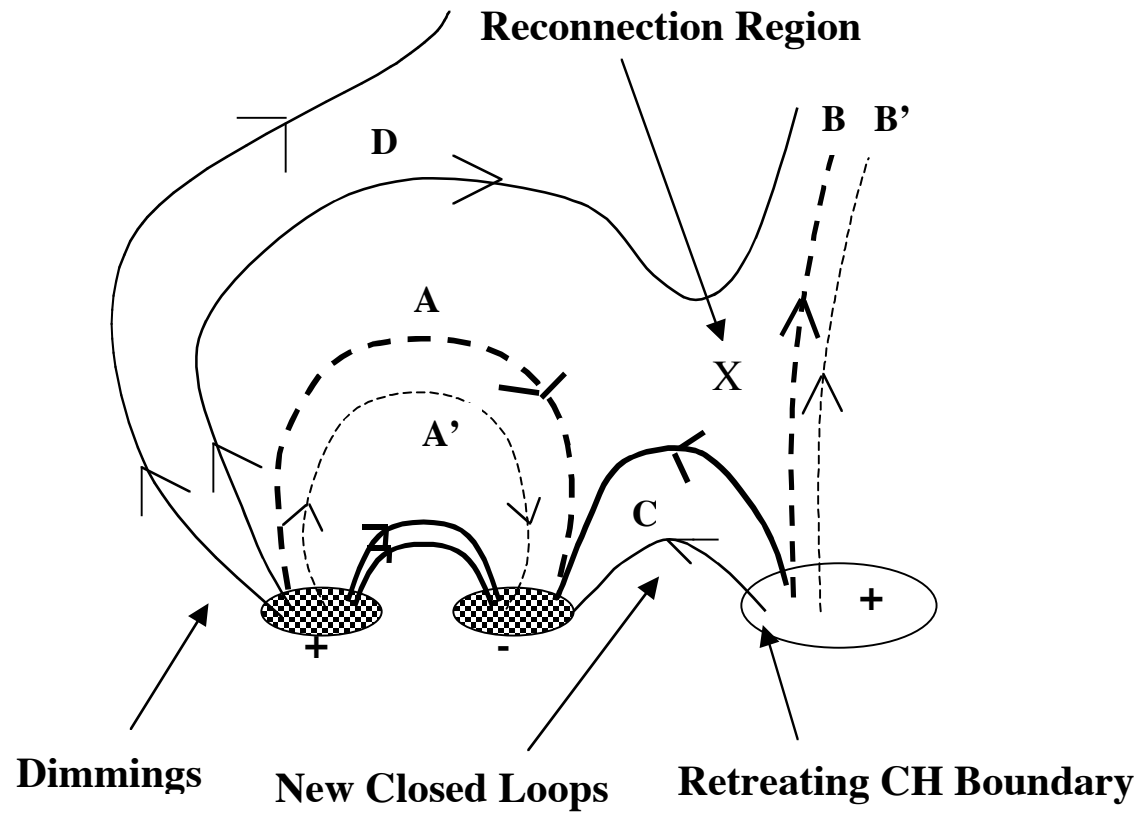


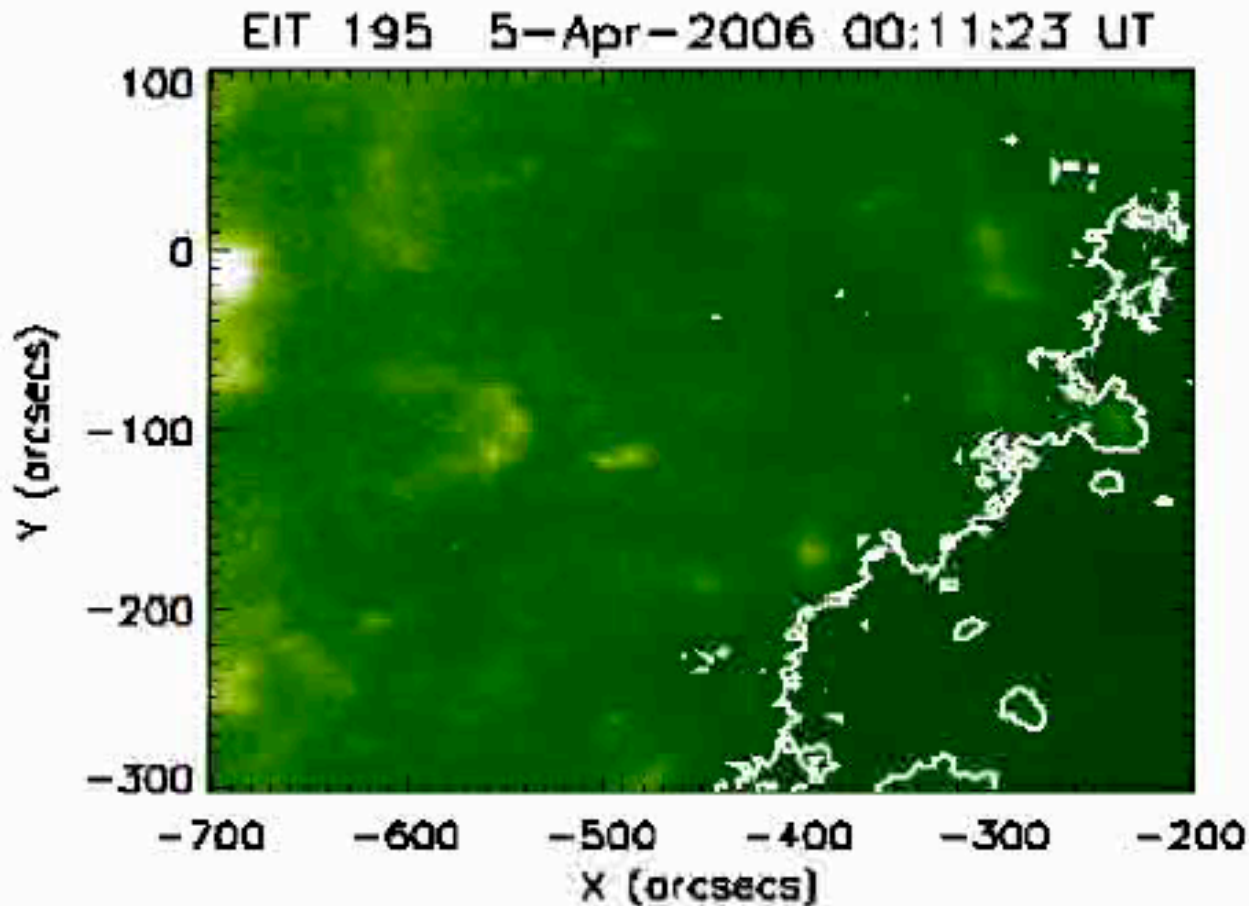


Active region AR 10689 emerges with a favorable magnetic field line orientation for interchange reconnection with the open field lines of the nearby coronal hole.

(SOHO/MDI full-disk magnetograms)

Interchange Reconnection

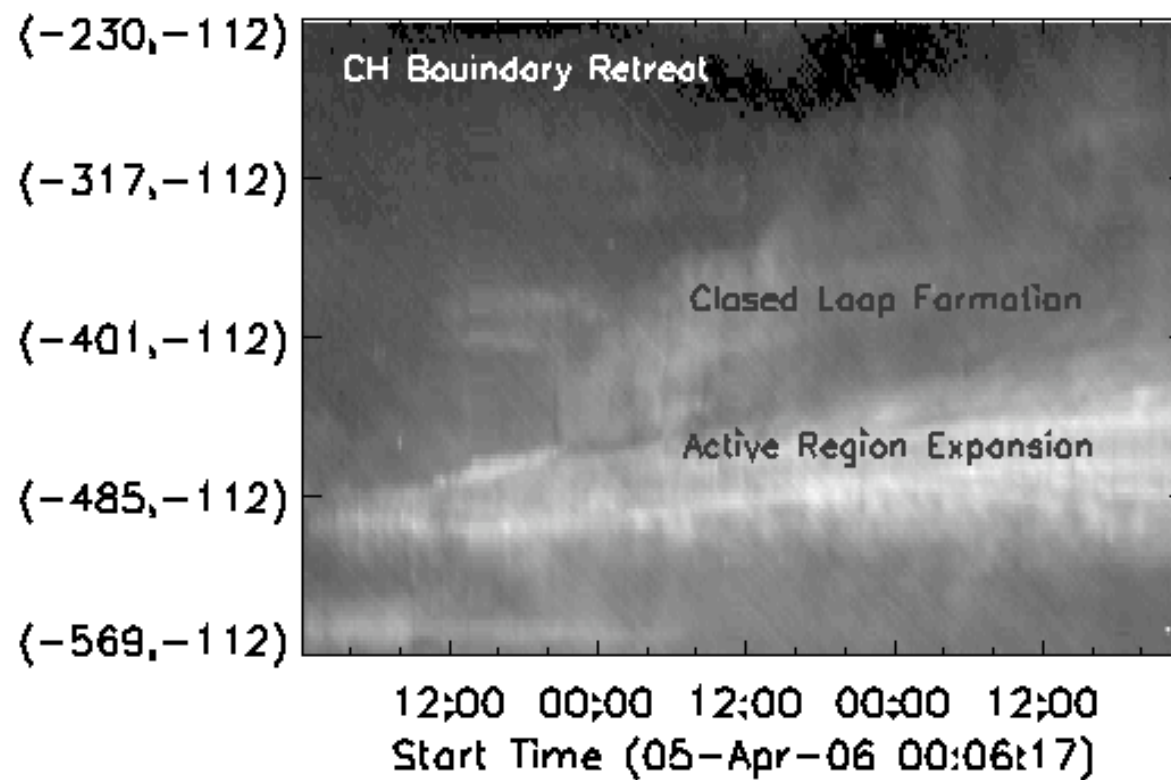




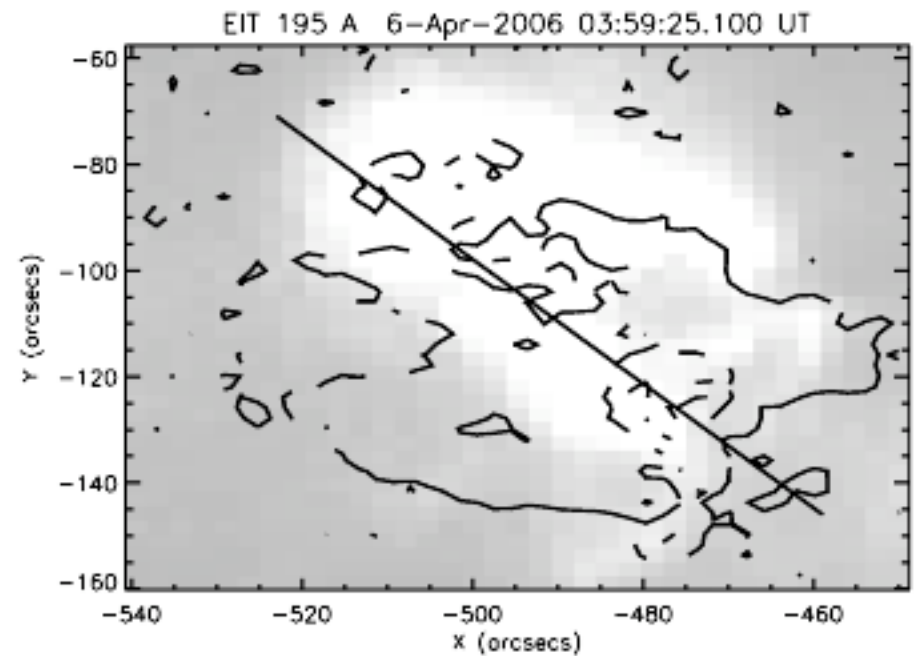
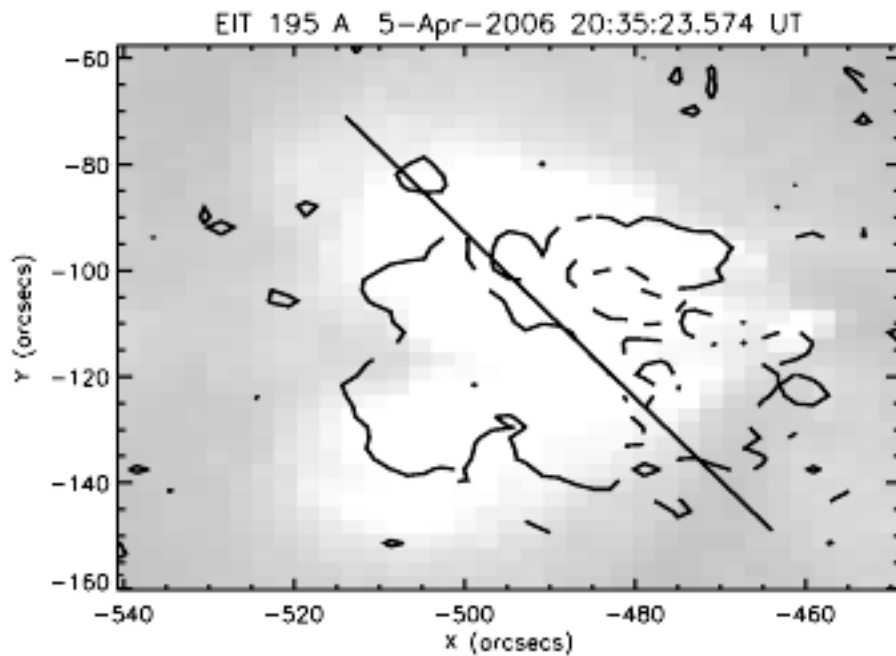
Evidence for interchange reconnection:

- Formation of new closed loops towards the coronal hole.
- Coronal hole shrinkage and boundary retreat.

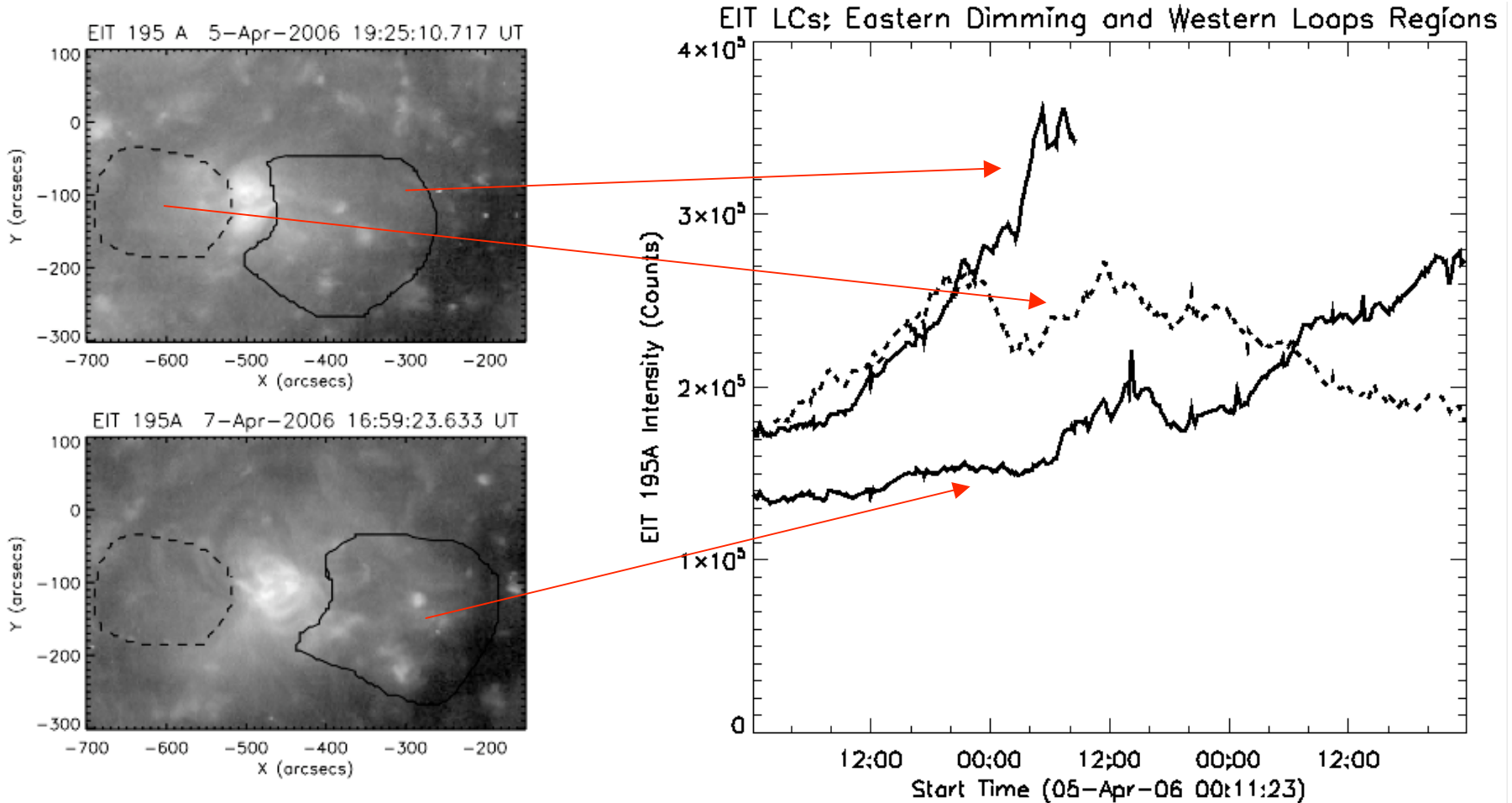
AR 10689 2D Plot



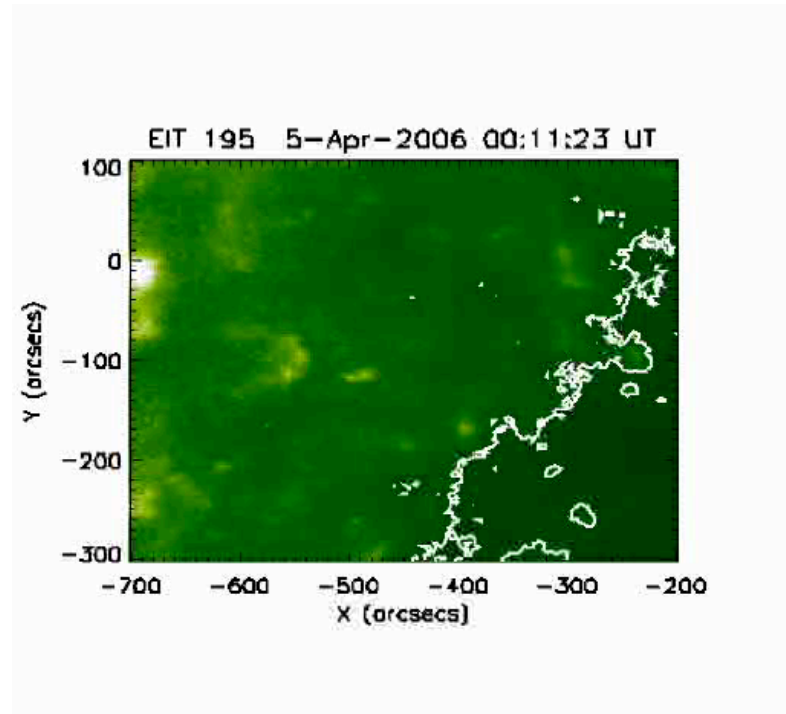
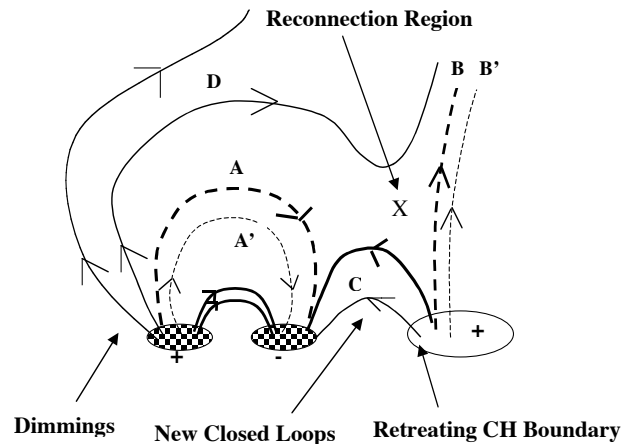
Evidence: Dimming on the far side of the active region.



Light Curves: Eastern Dimming and Western Loop Regions



Conclusions:



Evidence for interchange reconnection between emerging active region and coronal hole:

- Formation of **new closed loops**.
- **Shrinking** of the coronal hole.
- **Dimming** of the corona on the far side of the active region.

Taken together these observations provide strong evidence for the emerging active region - coronal hole interaction predicted from the model.

References:

- Attrill, G., Nakwacki, M.S., Harra, L.K., van Driel-Gesztelyi, L., Mandrini, C.H., Wang, J.: 2006, *Sol. Phys.*, **238**, 117
- Crooker, N.U., Gosling, J.T., Kahler, S.W.: 2002, *J. Geophys. Res.*, **107**, 1028
- Delaboudiniere, J.P. et al.: 1995, *Sol. Phys.*, **162**, 291
- Fisk, L.A. 2005, *Astrophys. J.*, **626**, 563
- Hudson, H.S., Acton, L.W., Freeland, S.L.: 1996, *Astrophys. J.*, **470**, 629
- Scherrer, P.H.: 2005, *Sol. Phys.*, **162**, 129
- van Driel-Gesztelti, L.: 2006 IAUS, 233, Cambridge University Press, 2006, p205

