



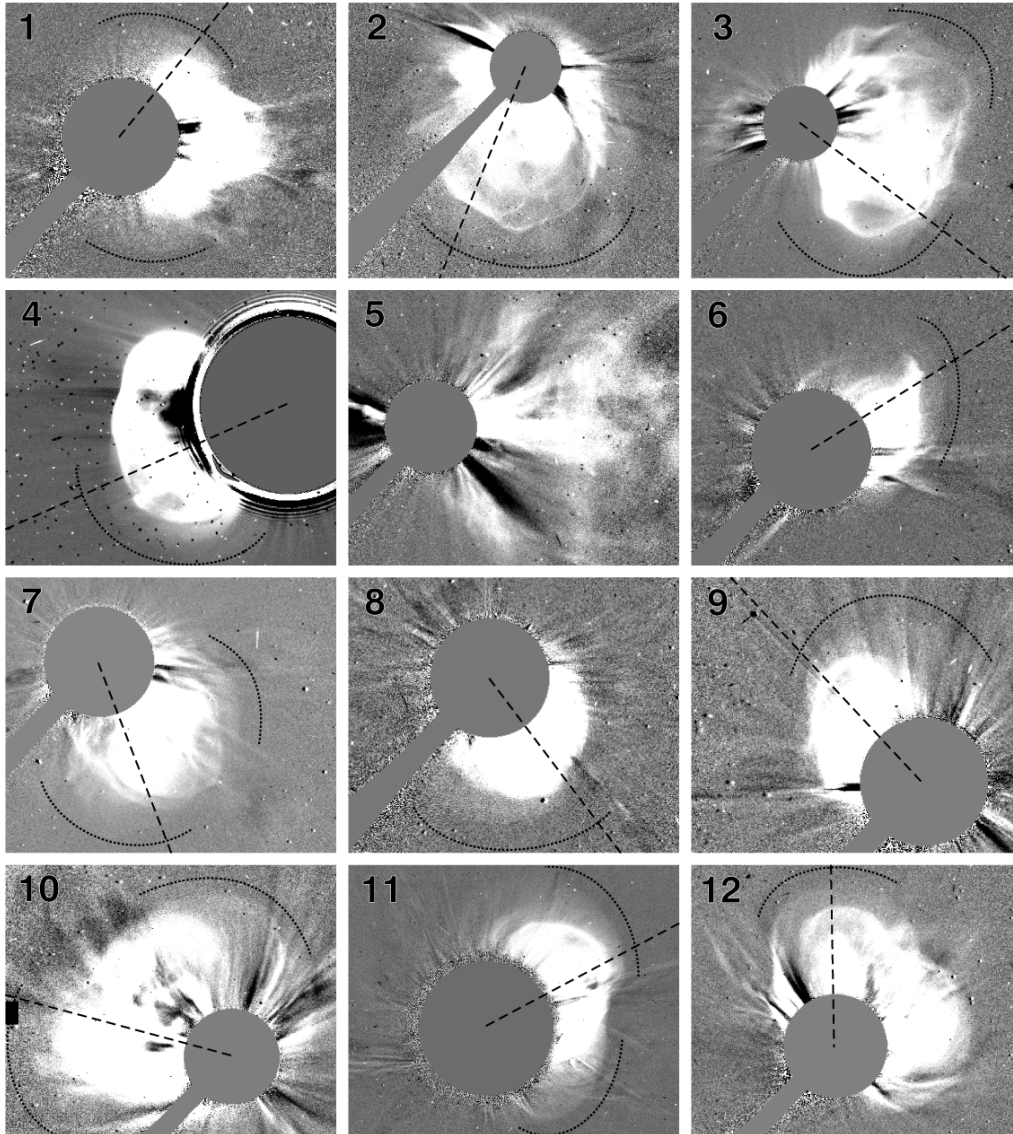
3D Morphology of CME-driven Shocks

(work in progress)

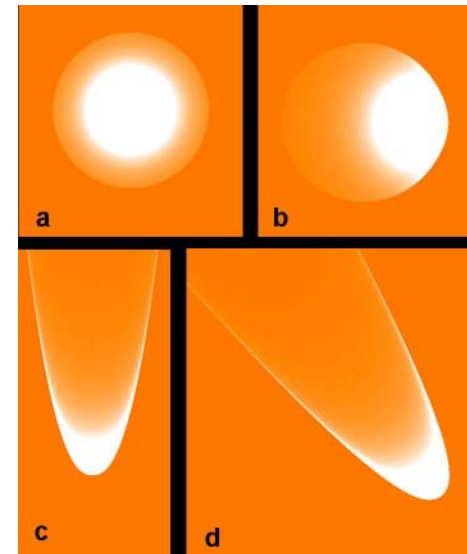
V. Ontiveros, A. Vourlidas, A. Thernisien

Modeling LASCO Shocks

Ontiveros & Vourlidis 2009



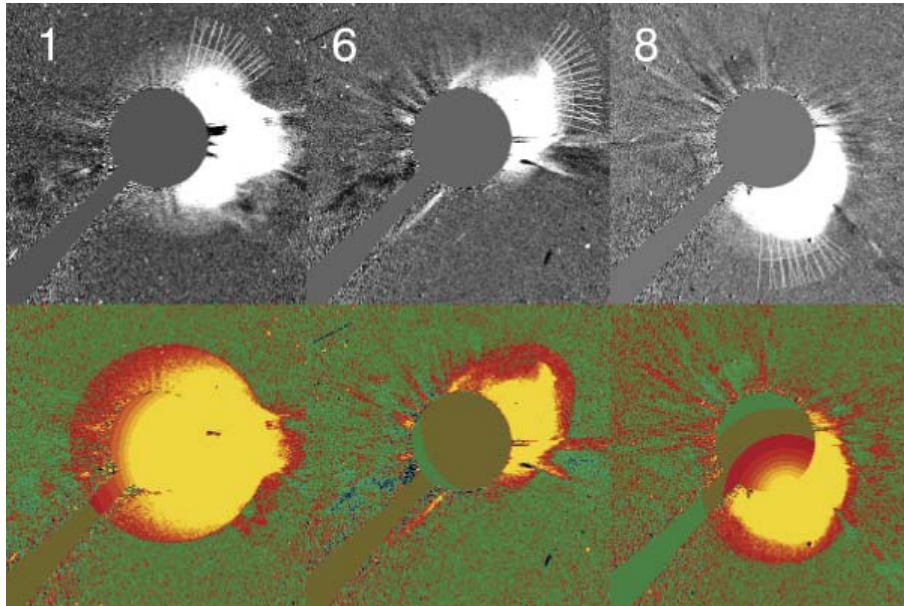
Geometric shock model



$$\frac{z}{d} = \frac{1}{s} \left(\frac{R}{d} \right)^s$$

Modeling LASCO Shocks

Ontiveros & Vourlidas 2009

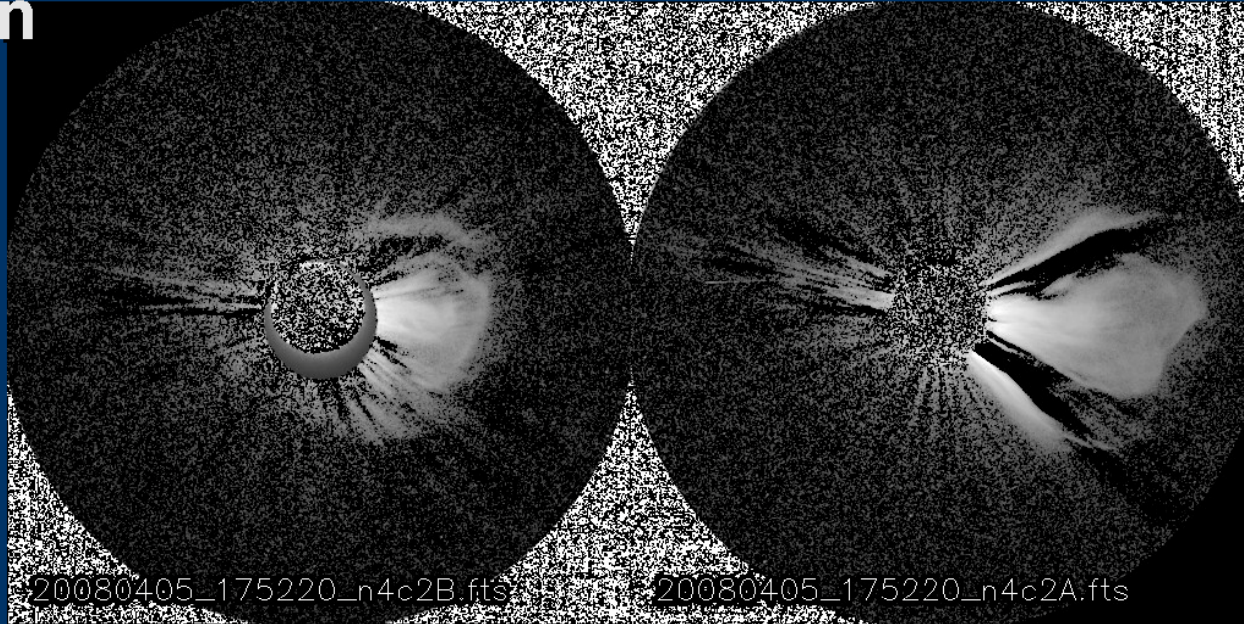


Positional Information of CME Shock

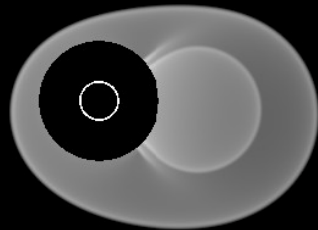
event	shock nose	source region
971106	S13W56	S18W63
980604	N47W138	N43W107
981126	S38W108	S26W134

Event of 2008 Apr 05

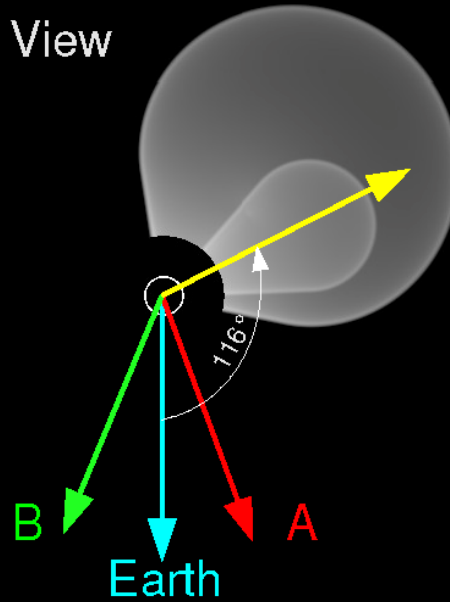
Direction



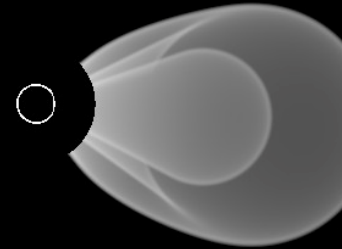
B



Polar View

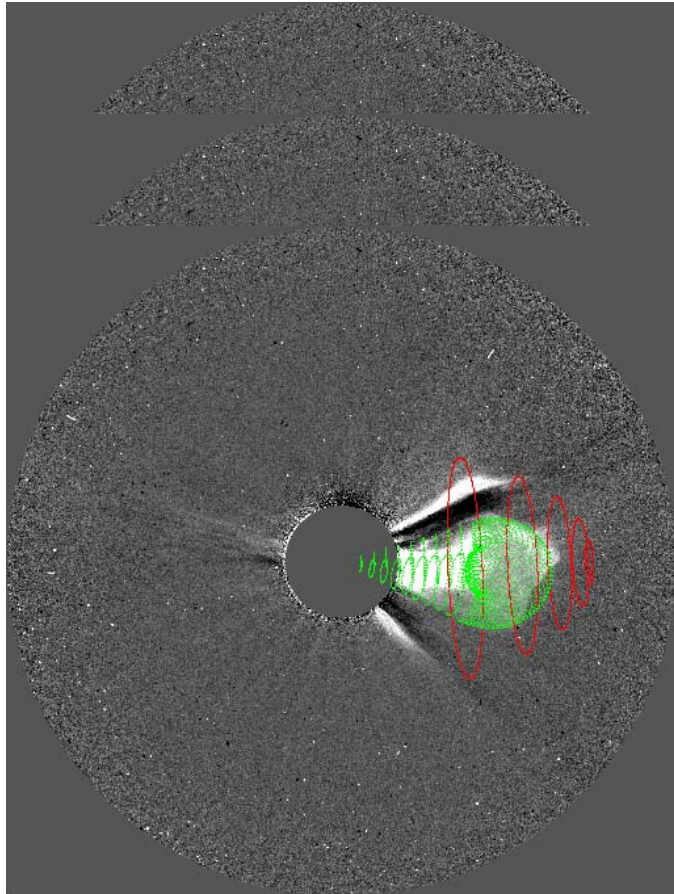


A

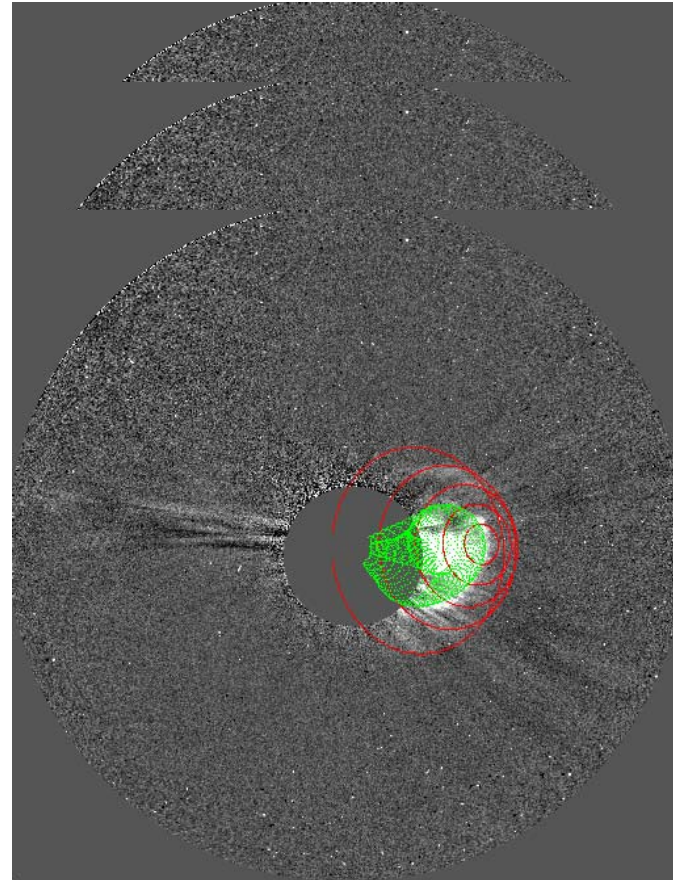


SECCHI Forward Modeling (CME + Shock)

COR2-A



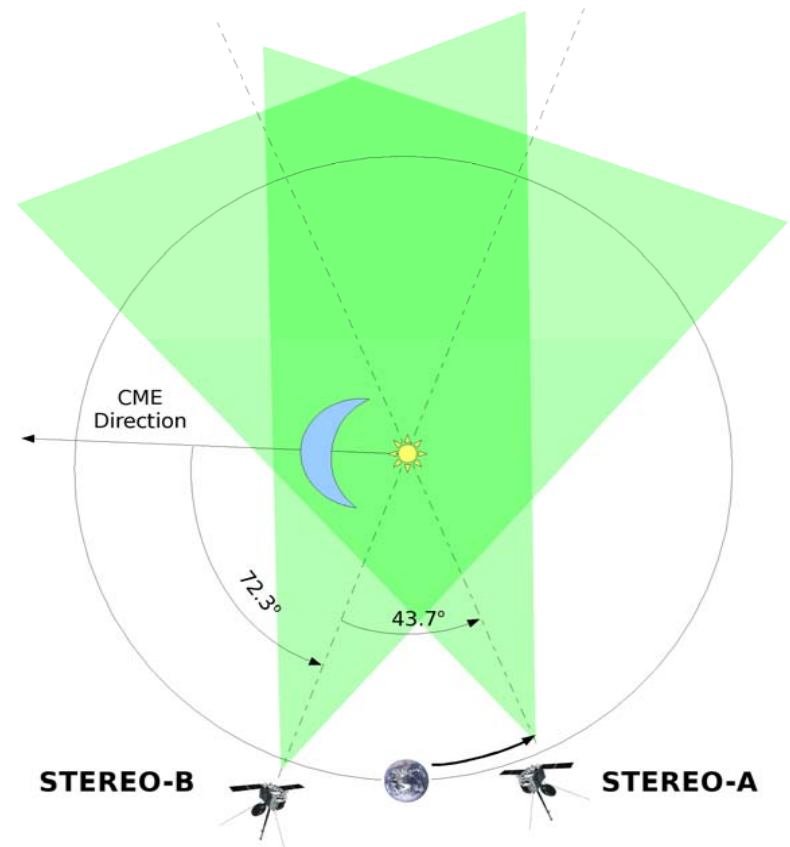
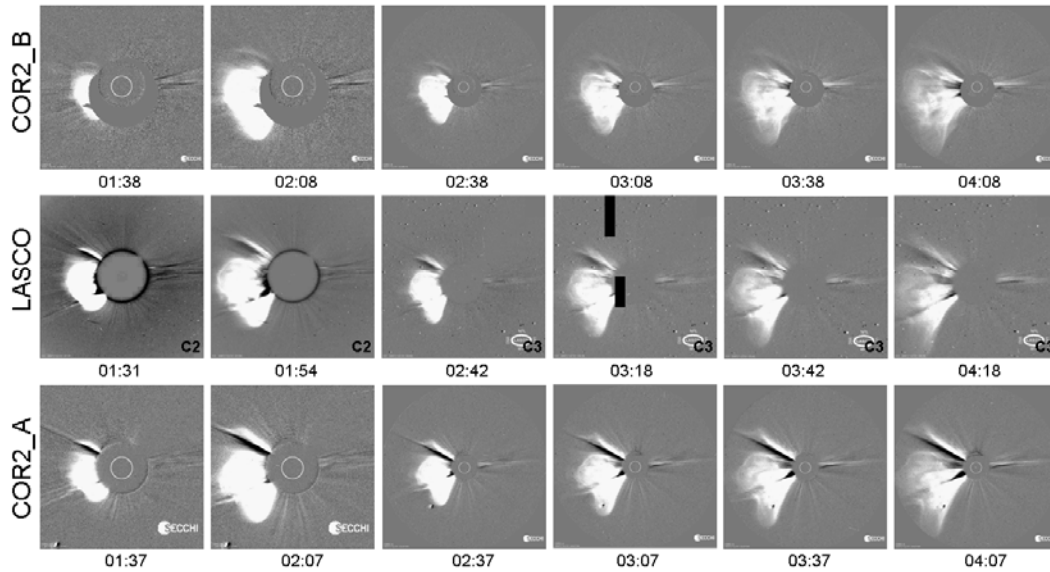
COR2-B



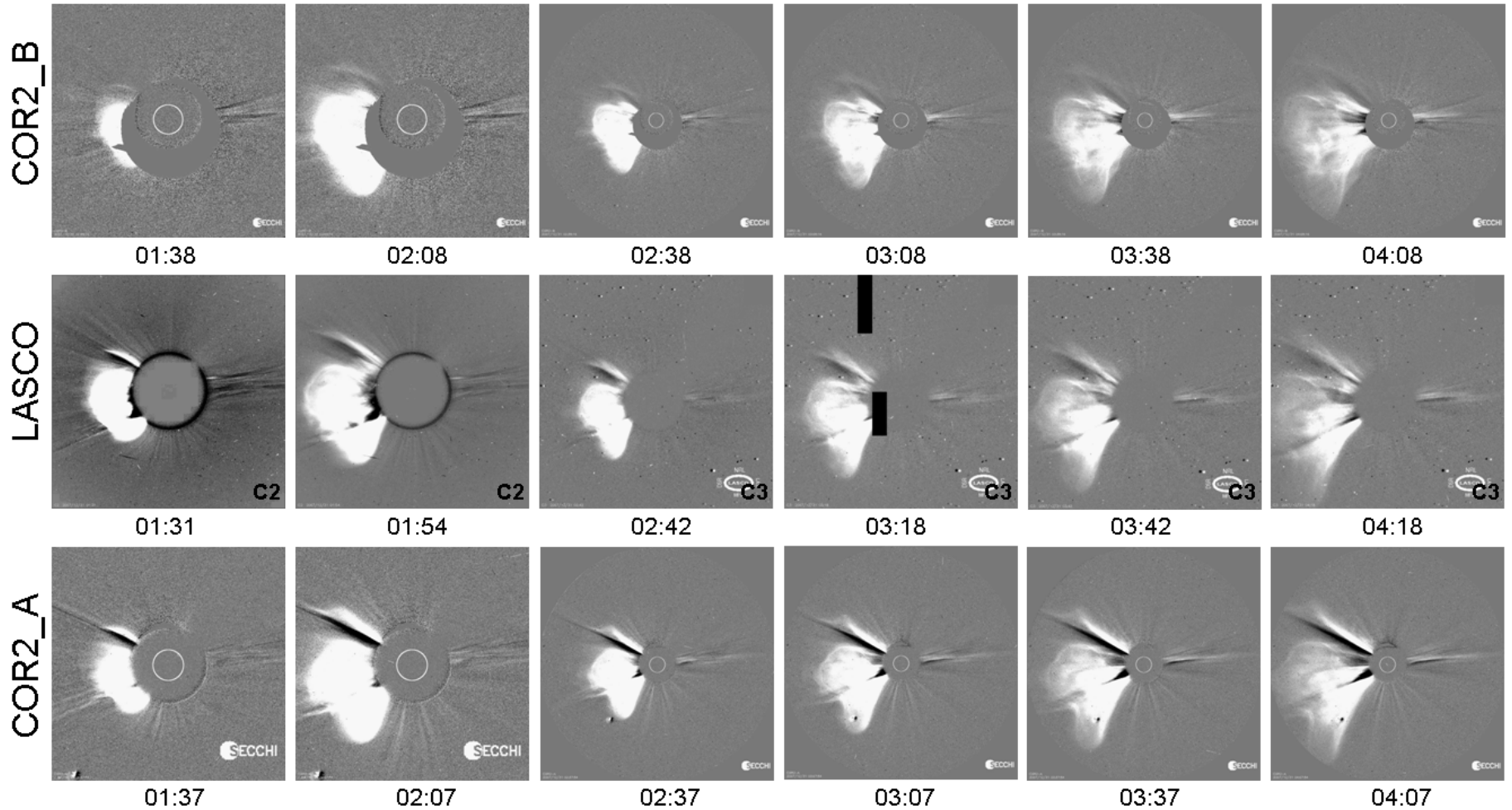
CME at W109
Shock at W109

December 31, 2007 CME – Direction

Dec 31st, 2007

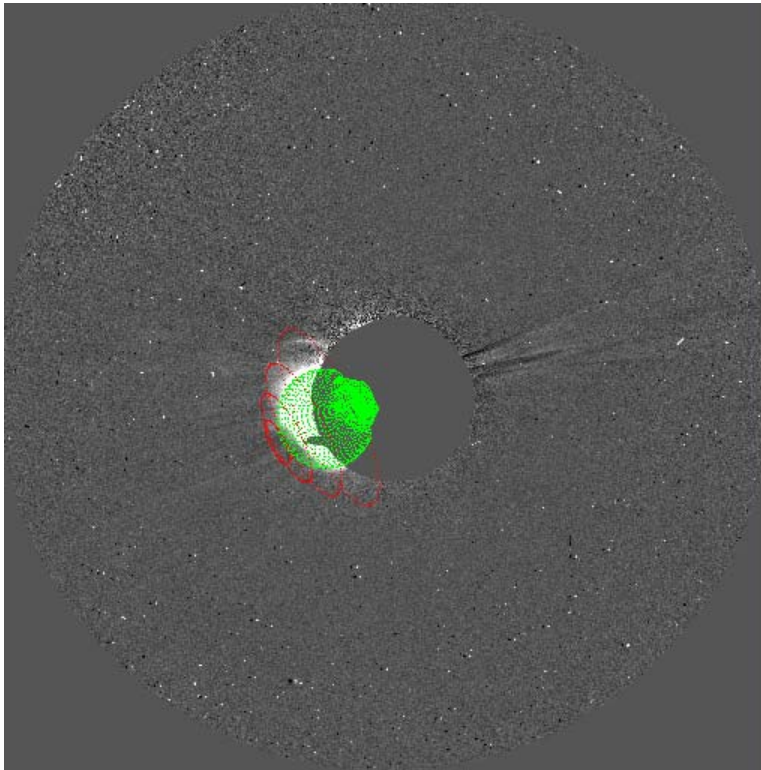


SECCHI Shock Modeling: 12/31/2007 Event

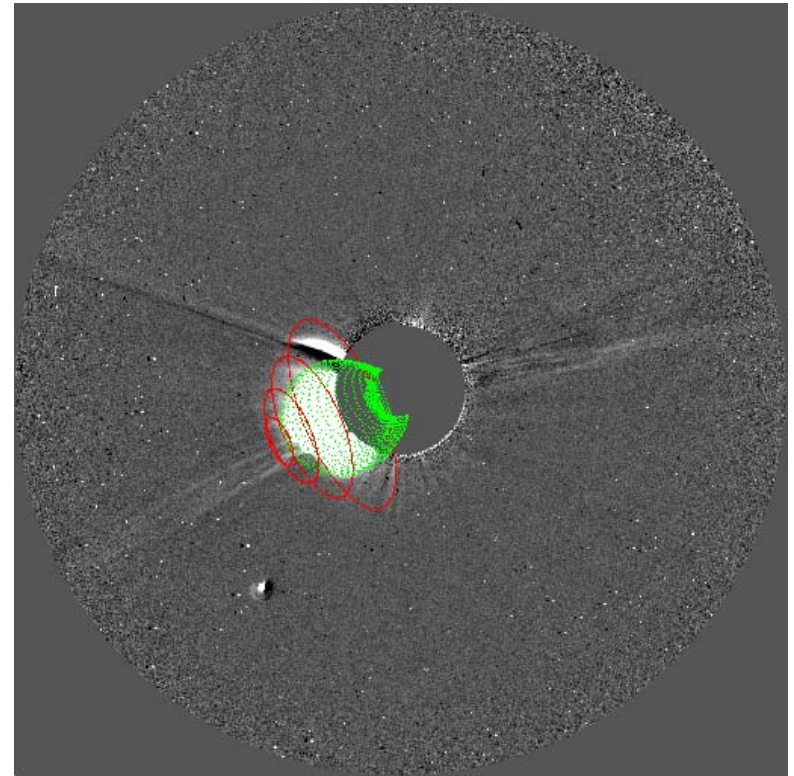


SECCHI Forward Modeling (CME + Shock)

COR2-B

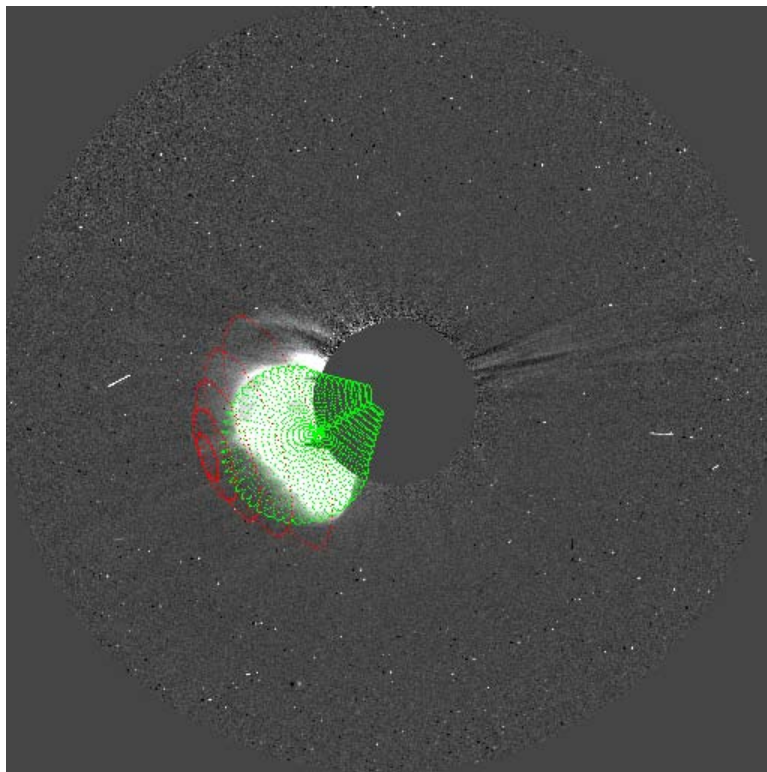


COR2-A

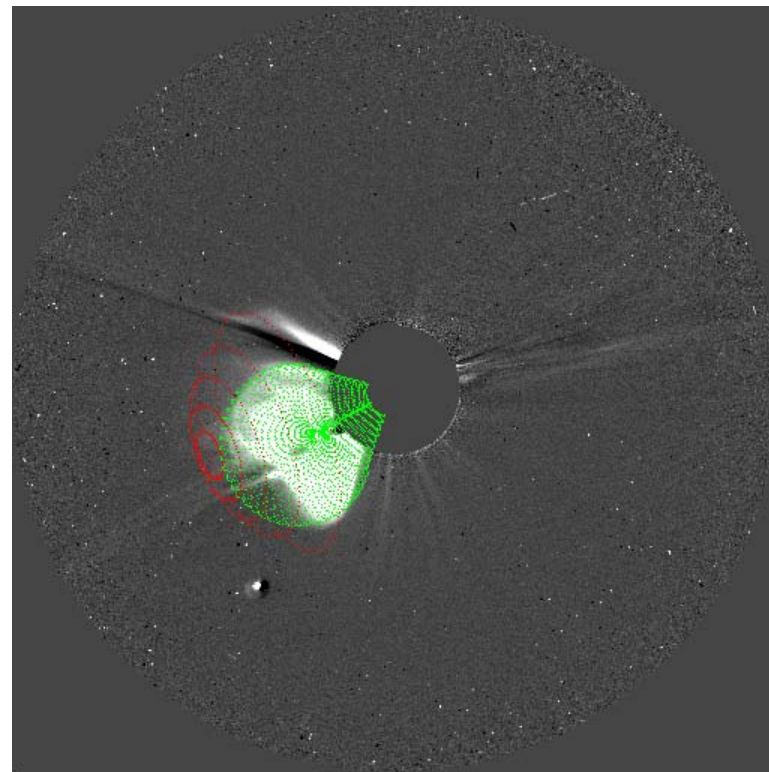


SECCHI Forward Modeling (CME + Shock)

COR2-B



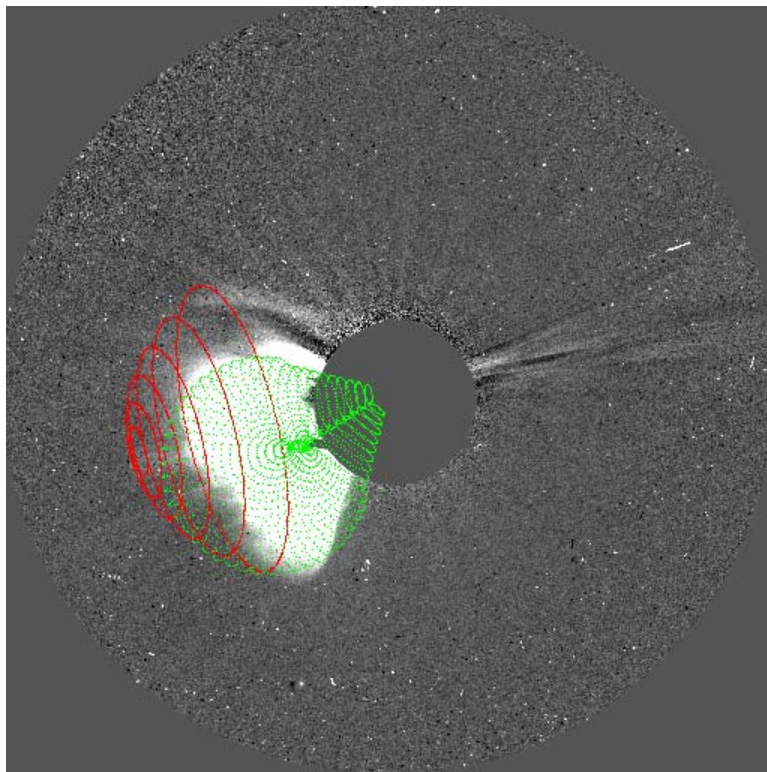
COR2-A



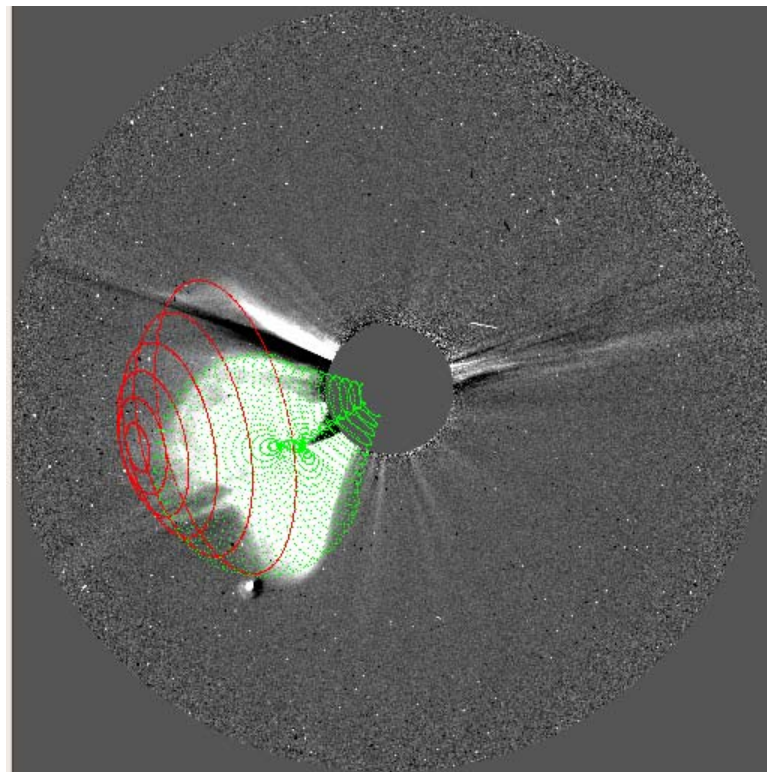
CME at E93S15 $h = 7.9 R_s$
Shock at E93S06 $h = 8.5 R_s$

SECCHI Forward Modeling (CME + Shock)

COR2-B



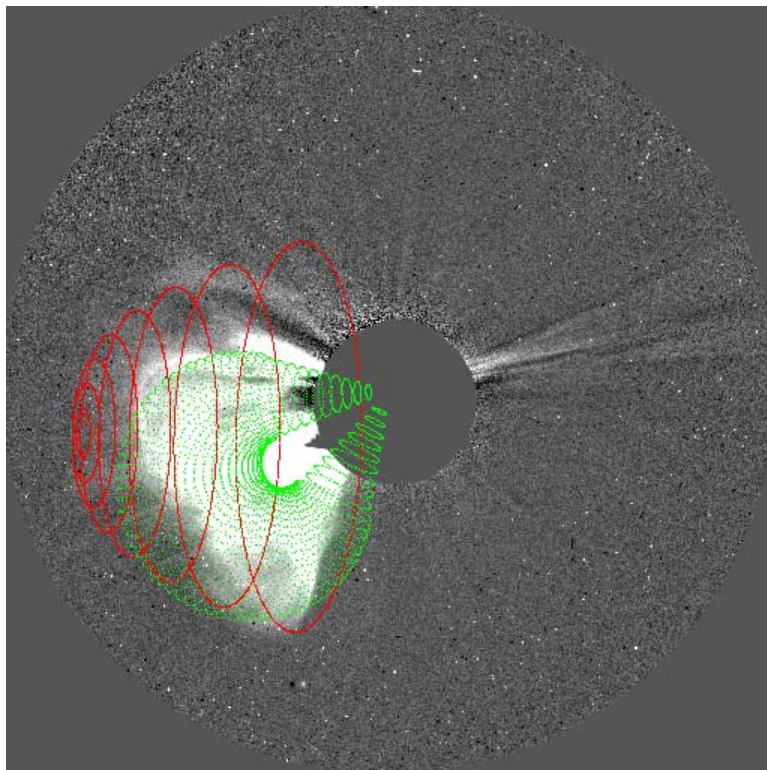
COR2-A



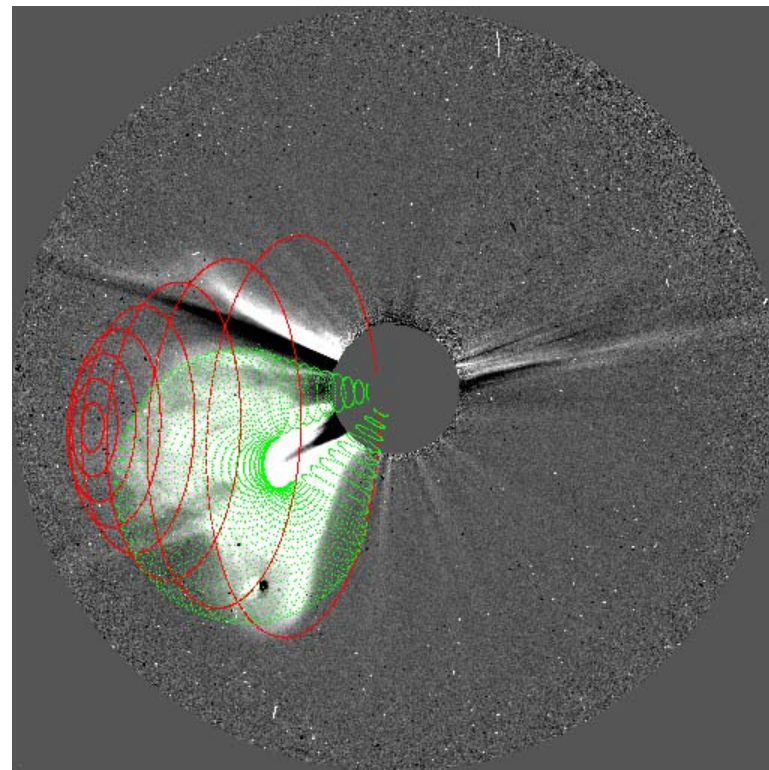
CME at E93S16 $h = 10.6 R_s$
Shock at E93S01 $h = 11.3 R_s$

SECCHI Forward Modeling (CME + Shock)

COR2-B



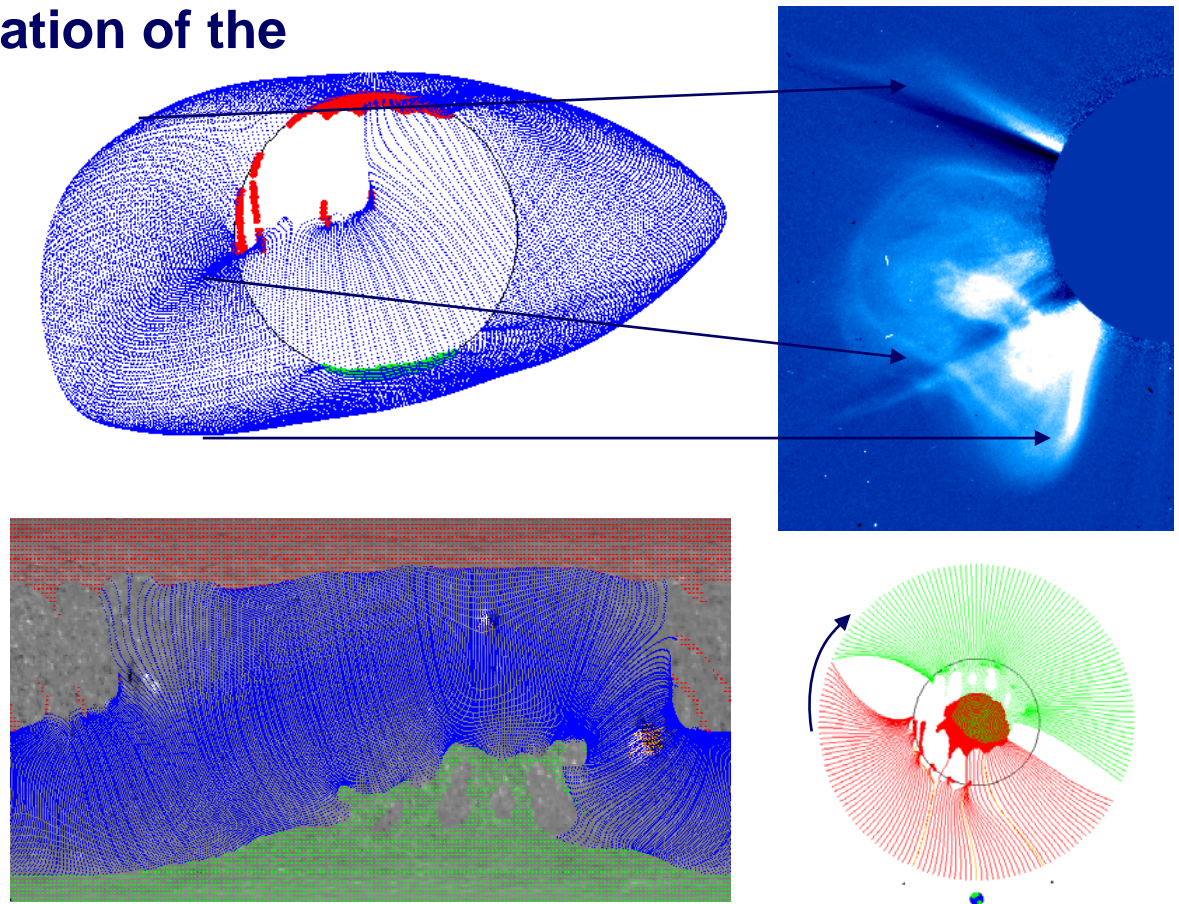
COR2-A



CME at E93S18 $h = 12.8 R_s$
Shock at E93S00 $h = 13.1 R_s$

Asymmetric shock expansion?

The large-scale Coronal Magnetic Field affects the shape/propagation of the white light shock.



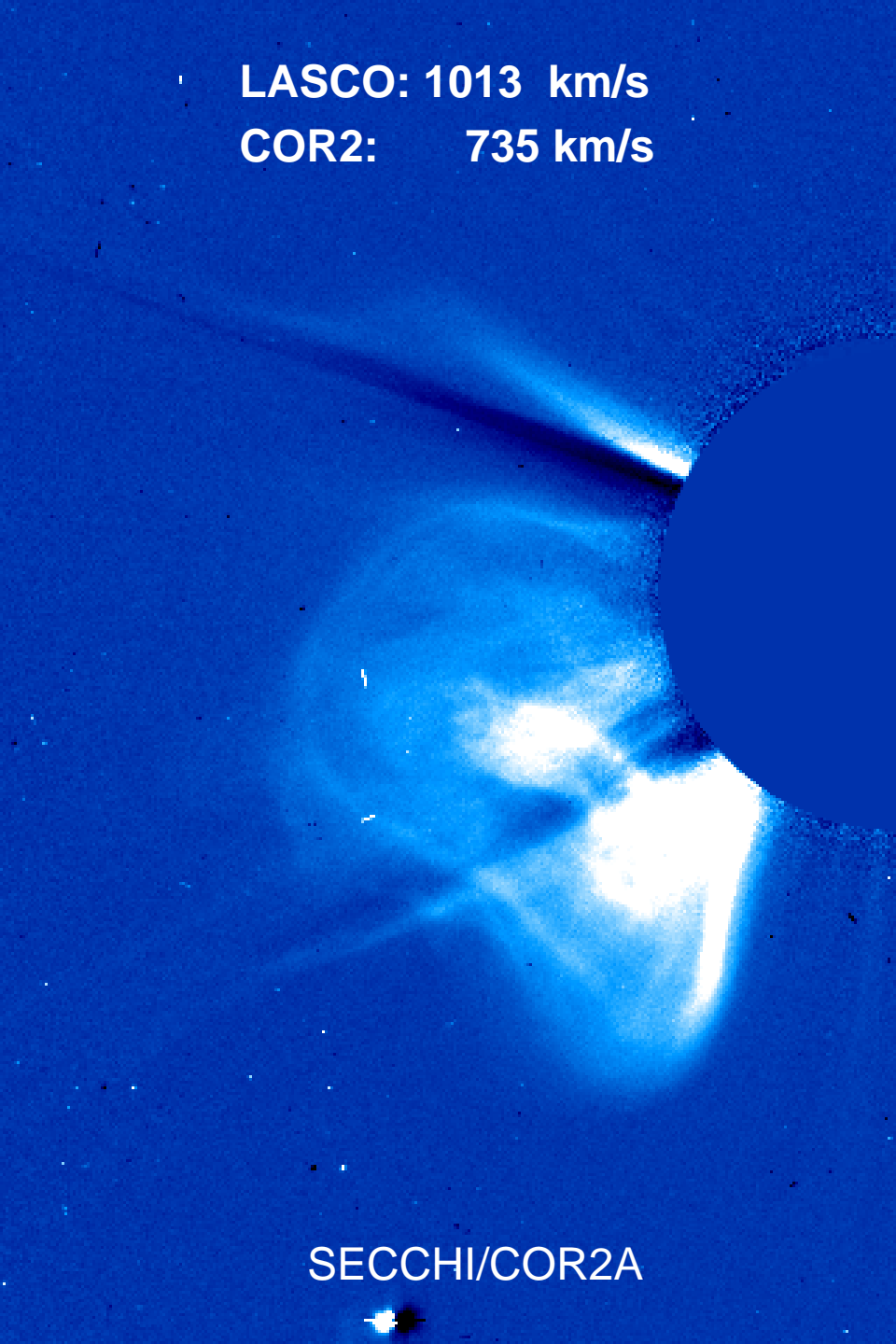
GONG / Synoptic Maps

Conclusions

- **We can estimate the 3D morphology of the shock using forward modeling**
- **We can derive direction, speed, size of the shock**
- **Some events show deviations from a symmetric shock shape. This points to influence of large scale magnetic field on the shock properties.**

LASCO: 1013 km/s

COR2: 735 km/s



SECCHI/COR2A

CME-driven shock front

streamer deflected

compressed material

