

# Structure and evolution of dayside magnetopause reconnection exhaust

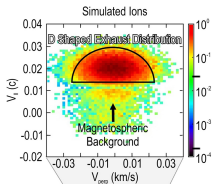
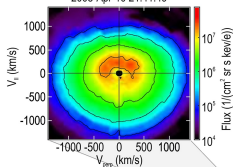
J Broll and many more

February 19, 2019

# Starting point: exhaust away from reconnection

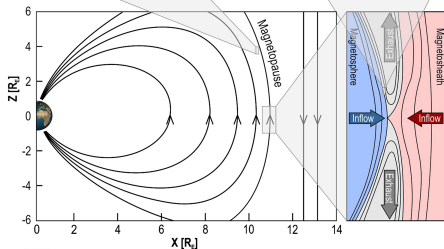
[Broll et al., 2016, JGR]

Cluster/HIA3 Ions:  
2008-Apr-10 21:41:49



Starting point: RX location

Signatures survive  $> 5R_E$



- What happens downstream?

- Two versions of the issue:

- breaking RX location method
- where does stuff go?

73491017

# Local stuff: D-shaped distribution stability?

Why don't D-shapes go unstable and fizzle out near RX?

- substantial  $T_{\perp}/T_{\parallel}$ , grows with  $B$  ( $\stackrel{?}{\leftarrow}$  CGL)
- substantial  $df/dv_{\parallel}$  at first

[Broll et al., it's going out soon, really]

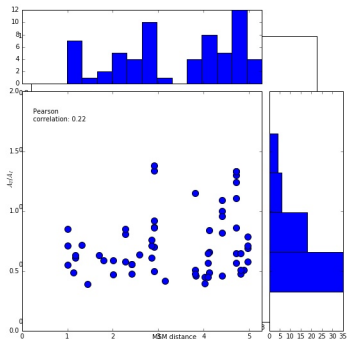


Figure: Ion temperature anisotropy / threshold for anisotropy-driven IC growth, [Isenberg+2012], vs. MSM distance

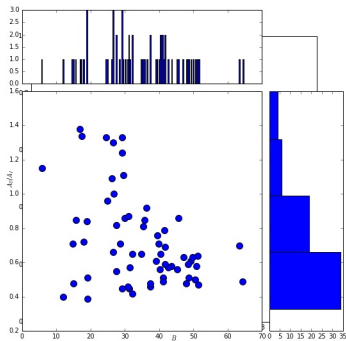


Figure: Ion temperature anisotropy / threshold for anisotropy-driven IC growth, [Isenberg+2012], vs.  $|B|$

# Local stuff: D-shaped distribution "stability" ...

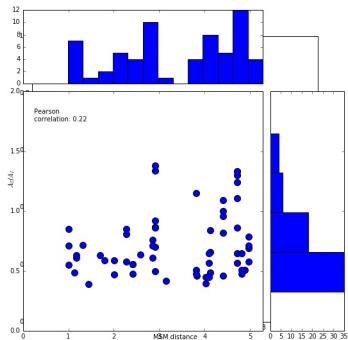


Figure: Ion temperature anisotropy / threshold for anisotropy-driven IC growth, [Isenberg+2012], vs. MSM distance

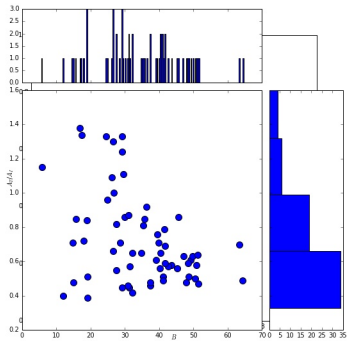


Figure: Ion temperature anisotropy / threshold for anisotropy-driven IC growth, [Isenberg+2012], vs.  $|B|$

Proposed solution:  $B$  incr  $\Rightarrow$  aniso increases to/past threshold  $\Rightarrow$  dist.s get nudged back, cycle repeats

## Global stuff: the tangle

That's with just one RX in every point's domain of influence

What if: multiple lines, flux ropes, embedded structures. . . ?

Proposed: predict and measure coalescence/ $2^{ary}$  RX/etc effects on known signatures - e.g. decrease in  $v_{jet}/v_A$  over RX distance  $\Rightarrow$  'drag' from structures in the path

Current: compiling bunches of crossings (e.g. noon $\pm$ 3h LT, 'full MP' and 'jet' in burst tag, good LMN), could use feedback on tools and tricks. . .

Github: @JeffreyBroll, currently uploading IDL tools for auto-LMN and more