Magnetic field in magnetosheath jets: A statistical study of B_Z near the magnetopause

L. Vuorinen, H. Hietala, F. Plaschke, A. T. LaMoury

UNIVERSITY OF TURKU

THEMIS case studies have shown that jets can influence magnetopause reconnection

- Hietala et al. (GRL, 2018): a jet compressed the magnetopause, triggering reconnection

P_{dyn} →

A unique feature of jets

- Nykyri et al. (JGR, 2019): jets with southward $\boldsymbol{B_Z}$ linked to triggering reconnection during northward IMF

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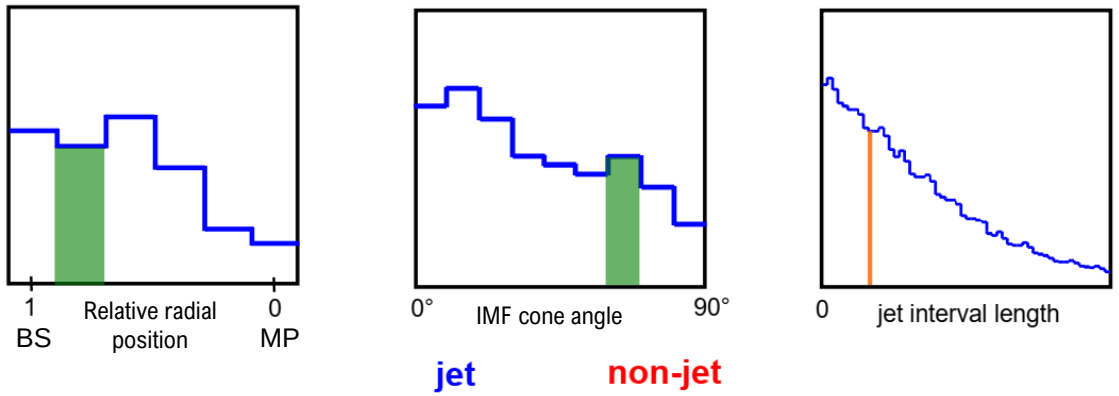
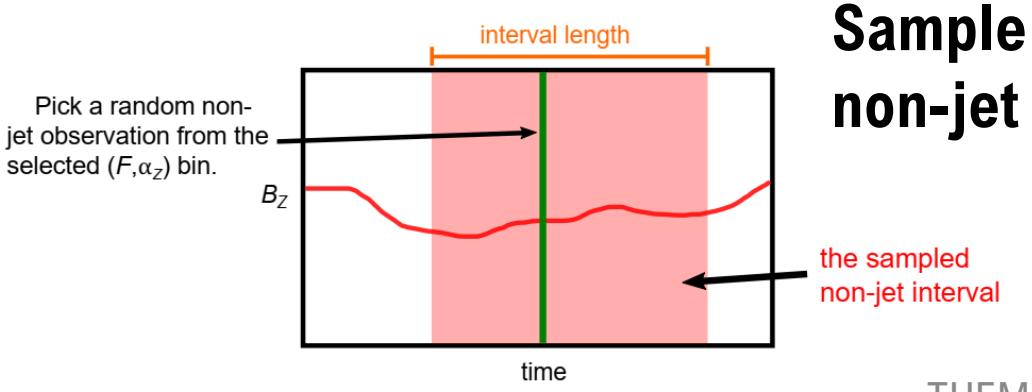
This study (Vuorinen et al., JGR, 2021): $\boldsymbol{B_Z}$ distribution in jets vs. $\boldsymbol{B_Z}$ distribution in the non-jet magnetosheath

How about statistically?

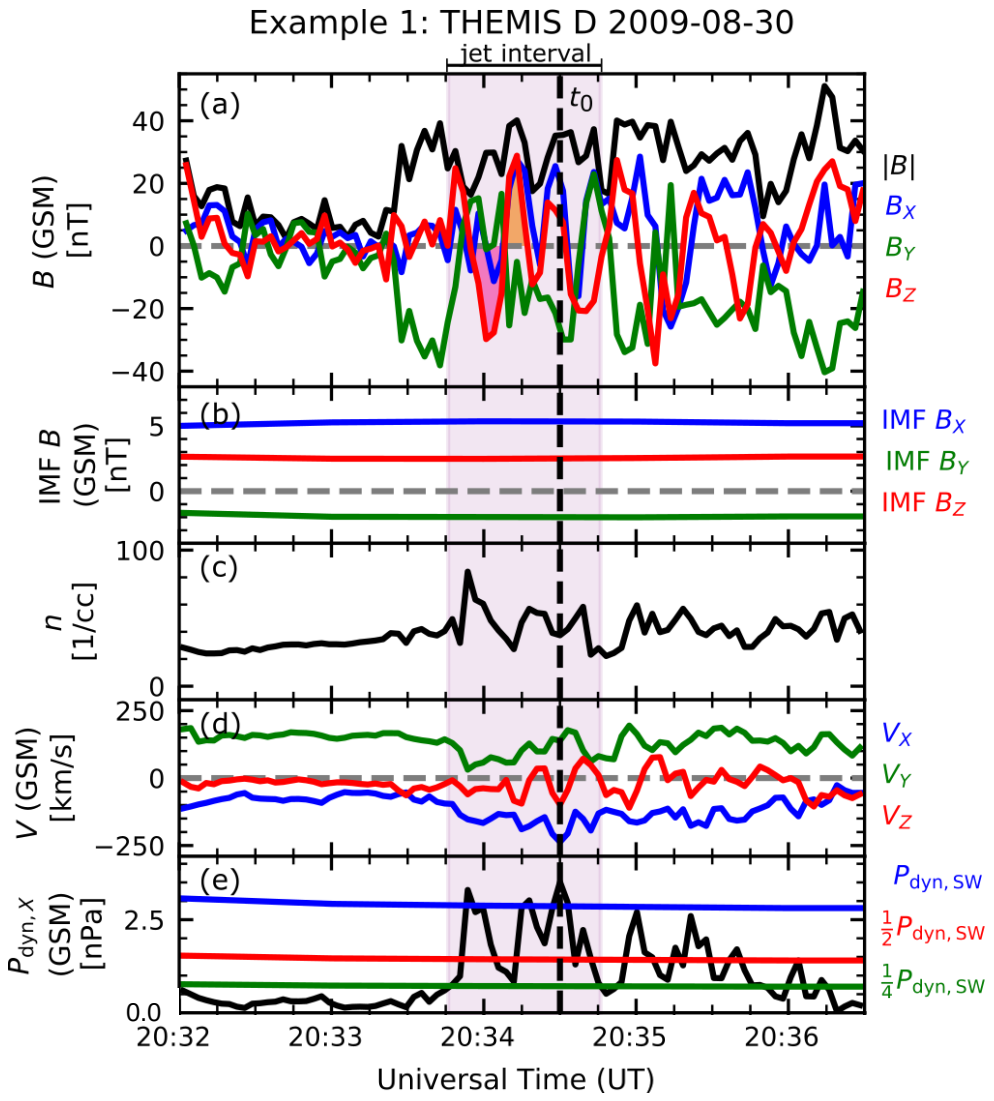
A statistical study of B_Z in magnetosheath jets

- Plaschke et al. (2013) THEMIS 2008—2011 data set with ~3000 jets
- OMNI data for IMF conditions





Sample comparable non-jet intervals



A statistical study of B_Z in magnetosheath jets: northward IMF

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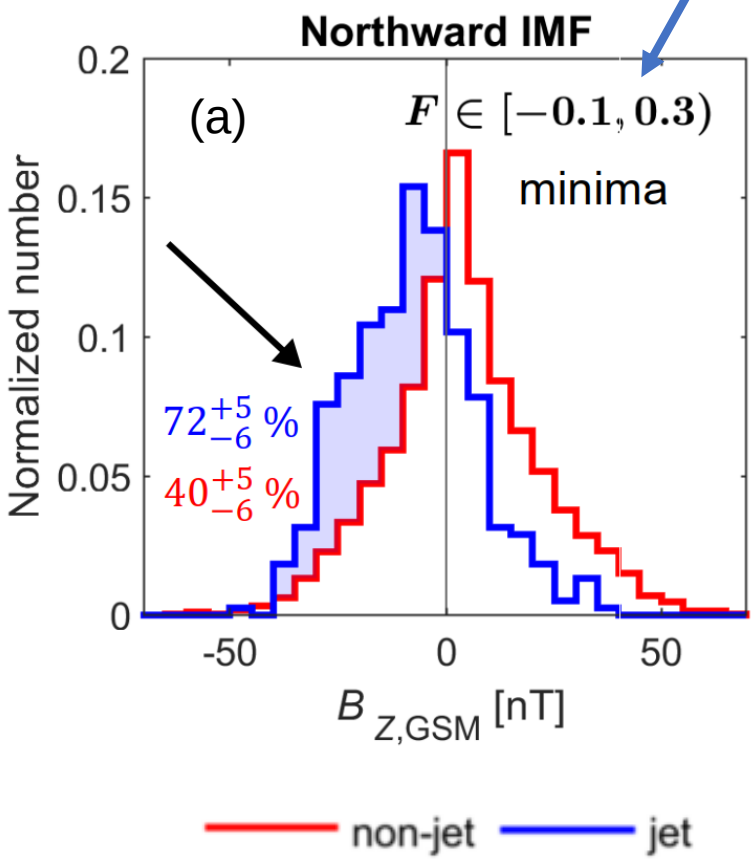
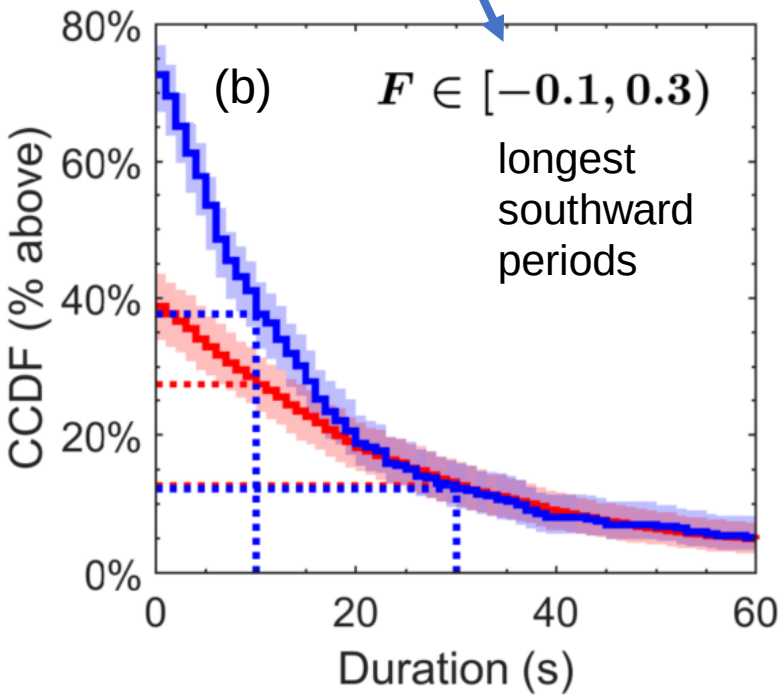
near the magnetopause





Conclusions

- Most jets exhibit some B_Z opposite to the IMF B_Z
- Most periods of opposite B_Z are short, but periods up to ~20 s are more common in jets

Read more:
Vuorinen et al., JGR, 2021