Overview

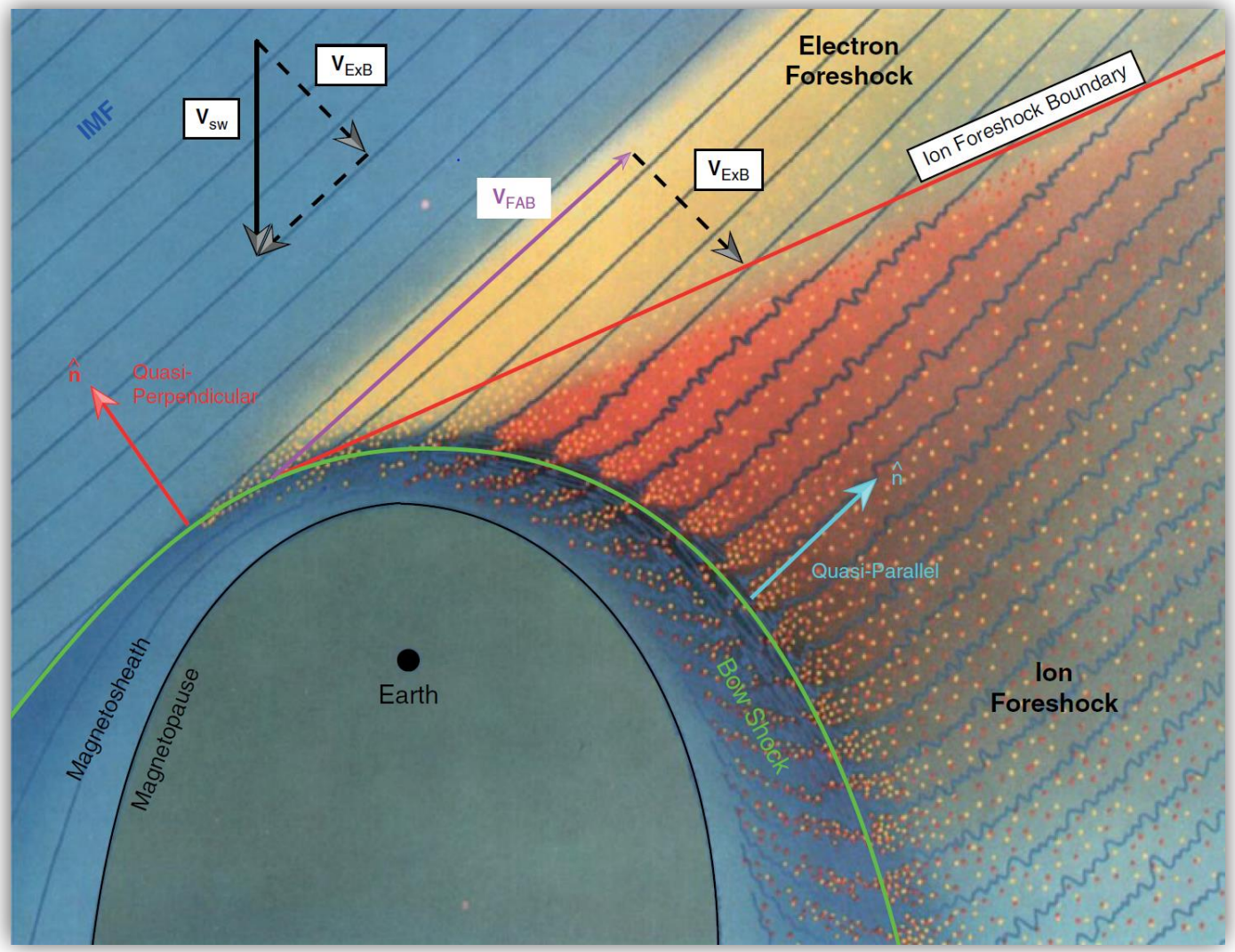
Investigation of Different Types of Magnetosheath Jets and their Origin using MMS

Savvas Raptis[1], Tomas Karlsson[1], Ferdinand Plaschke[2], Anita Kullen[1], P-A. Lindqvist[1]

[1]Division of Space and Plasma Physics, KTH Royal Institute of Technology, Sweden
[2]Space Research Institute, Austrian Academy of Sciences, Graz, Austria

AGU 2020
14/12/2020

Magnetosheath jets

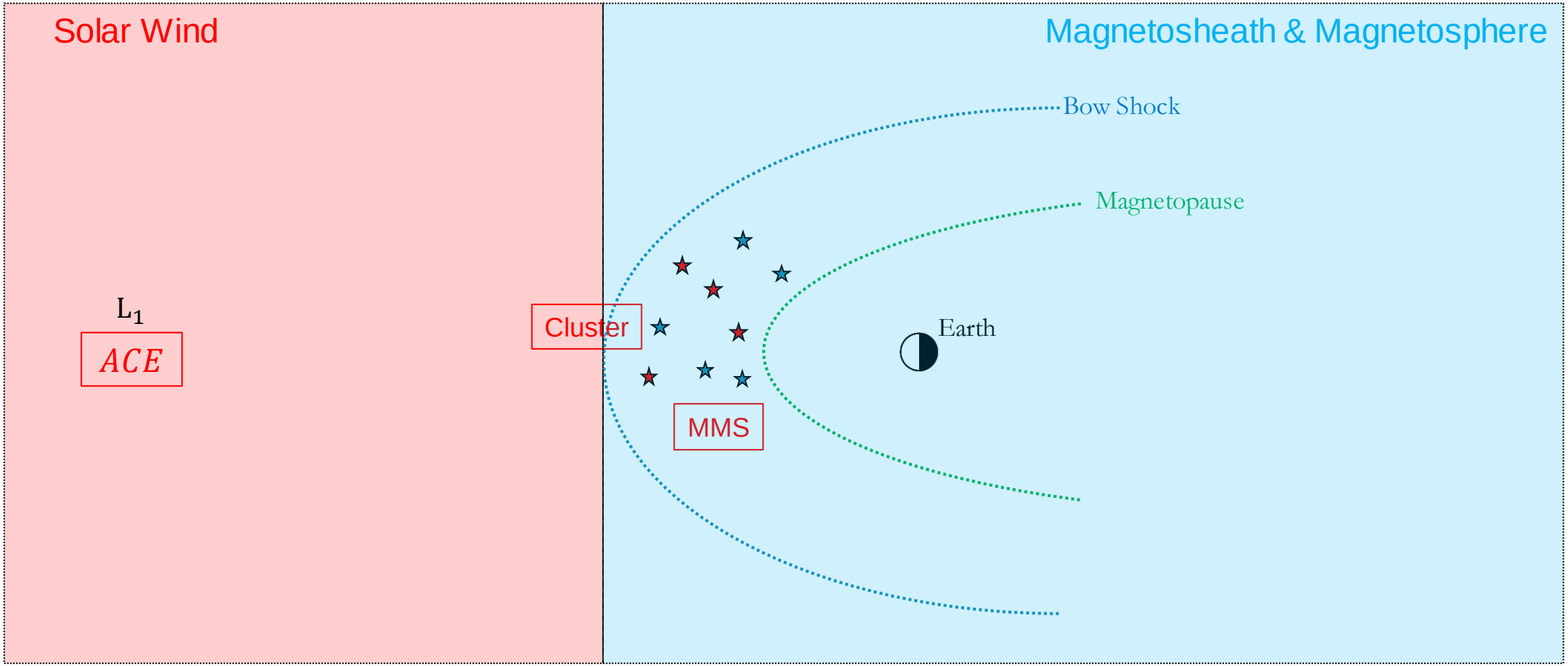


L. B. Wilson (2016) | Geophysical Monograph Series

In situ classification of jets

★ Quasi-parallel jet
★ Quasi-perpendicular jet

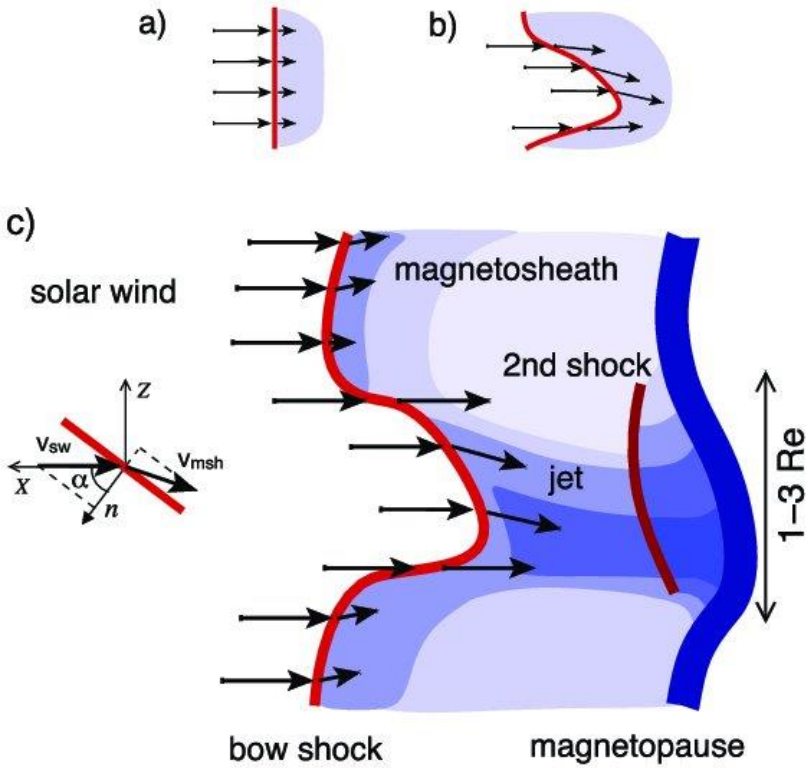
Key quantities: high energy flux, magnetic field variance, temperature anisotropy



Raptis, Karlsson, et al. (2020) | JGR
Karlsson, **Raptis**, et al. (2020) | Ongoing

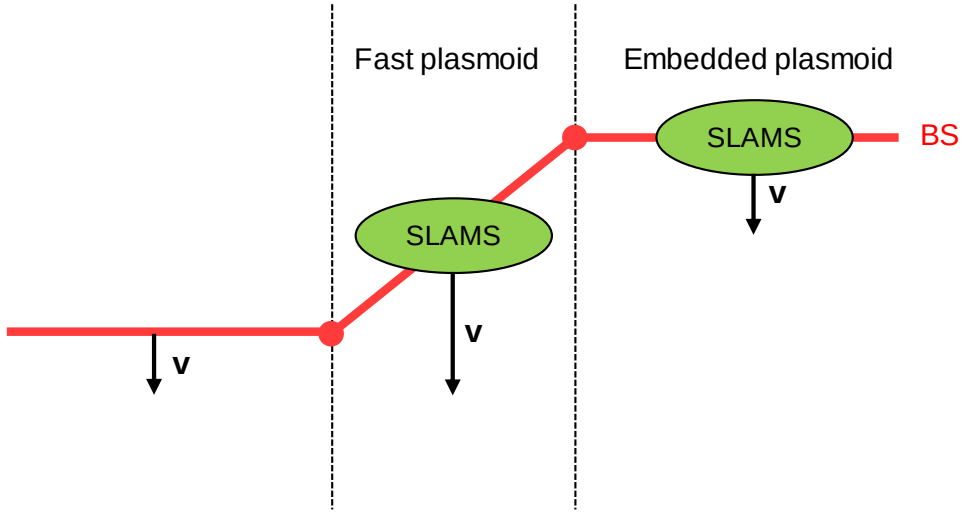
Connecting to existent mechanisms

Bow shock ripples



Faster flow (ΔV) → Less heated (ΔT)

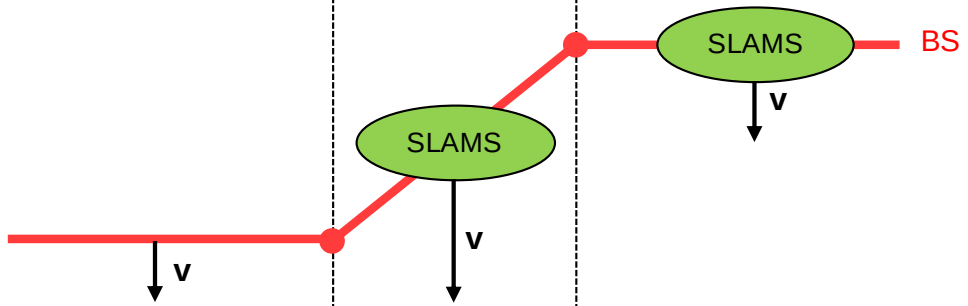
SLAMS penetration



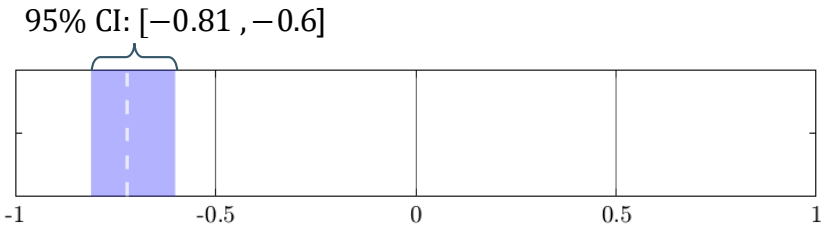
Steepened wave (ΔB) → Density enhancement (Δn)

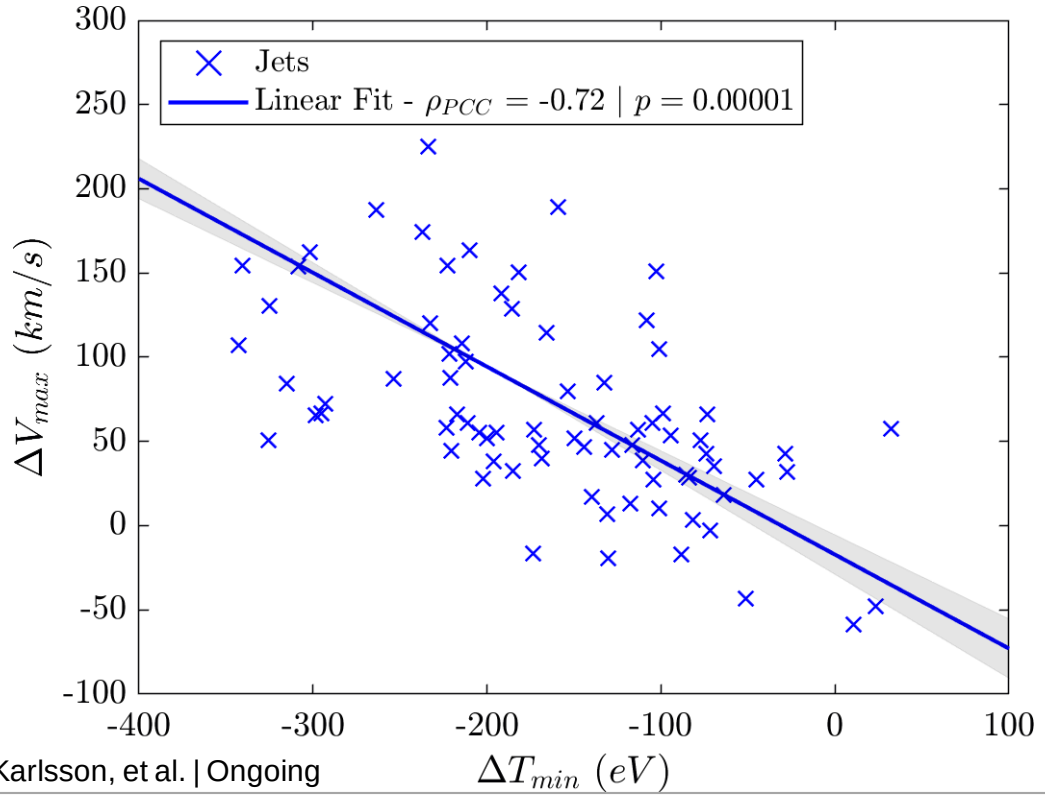
Qpar : Hietala et al., (2009,2012) | Qperp : Johlander et al. (2016)

Hietala et al., (2009,2012), Karlsson et al. (2015)

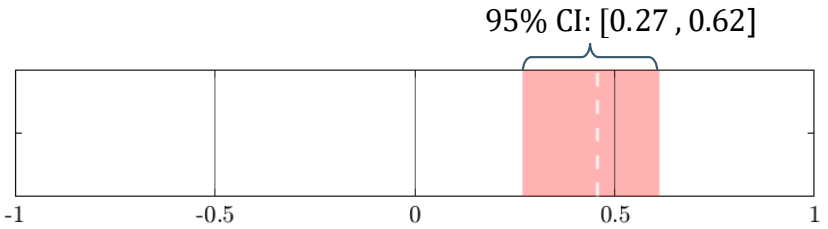


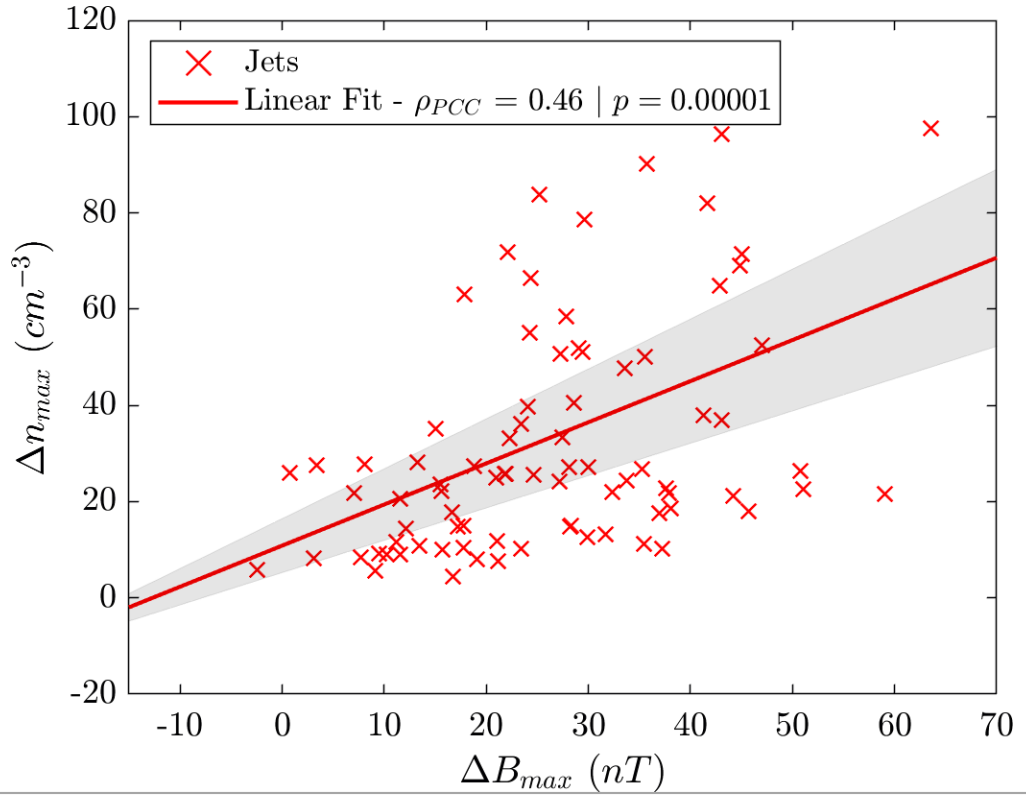
Ripples





SLAMS

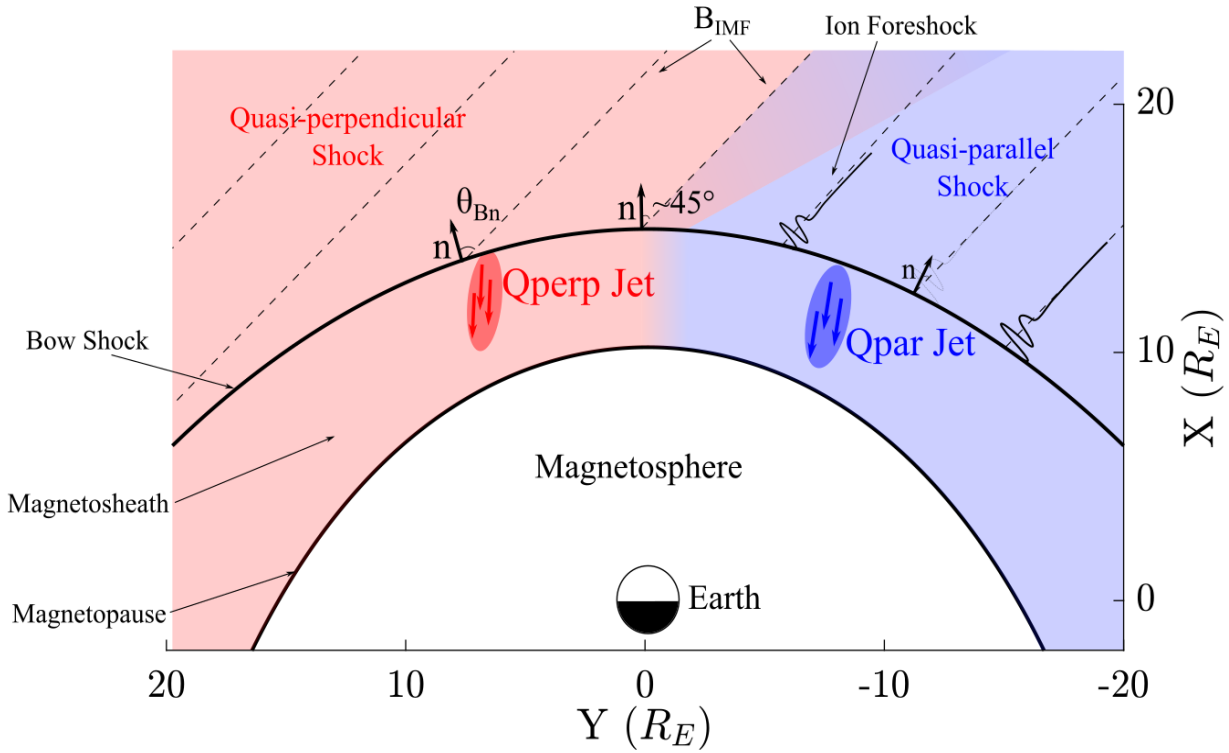




Raptis, Karlsson, et al. | Ongoing

Summary

- **Classification** with **MMS** and **Cluster** using in-situ data**.**
- Recently **published** and **ongoing** results on statistical properties and connection to generation mechanisms



Looking forward to your questions and comments

Raptis S., Aminalragia-Giamini S., et al. (2020) | Frontiers