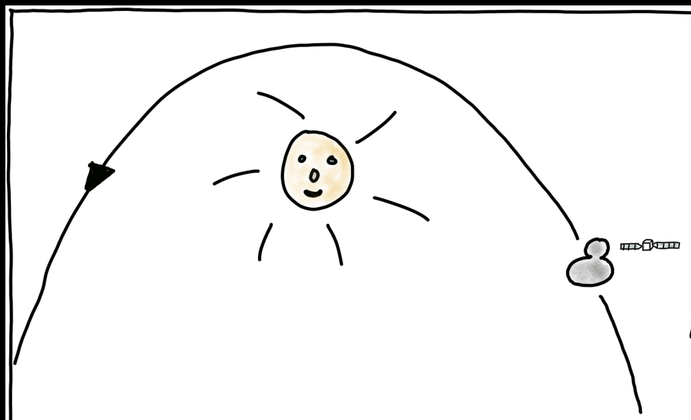
Plasma physics at comets

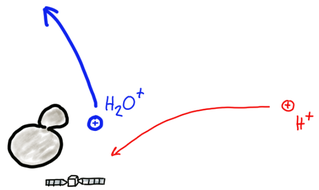
Waves and other features

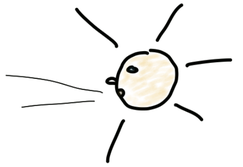
Herbert Gunell

Solar wind — comet interaction

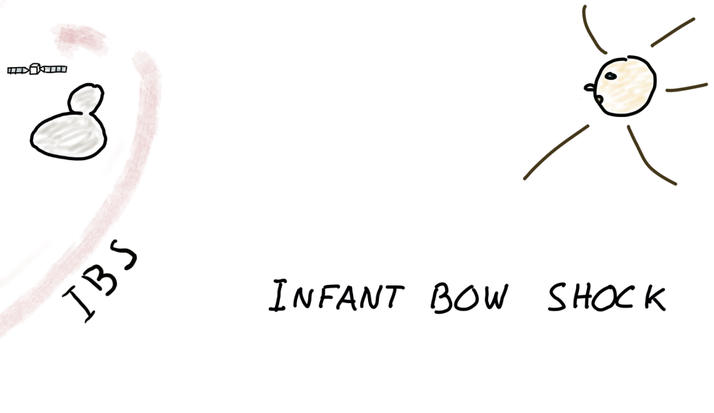


ELLIPTICAL ORBITS

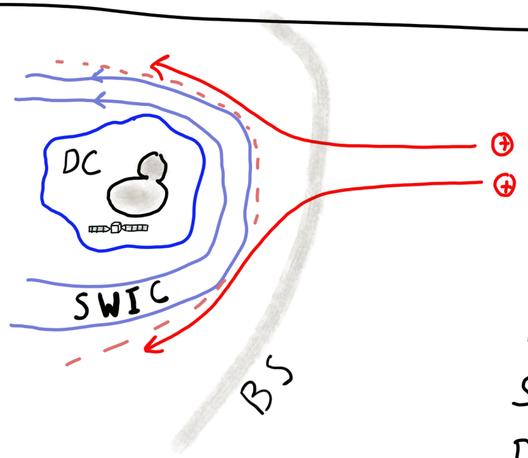


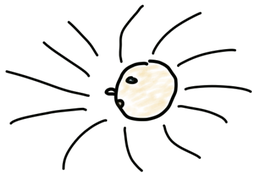


WEAK MASS-LOADING



INFANT BOW SHOCK

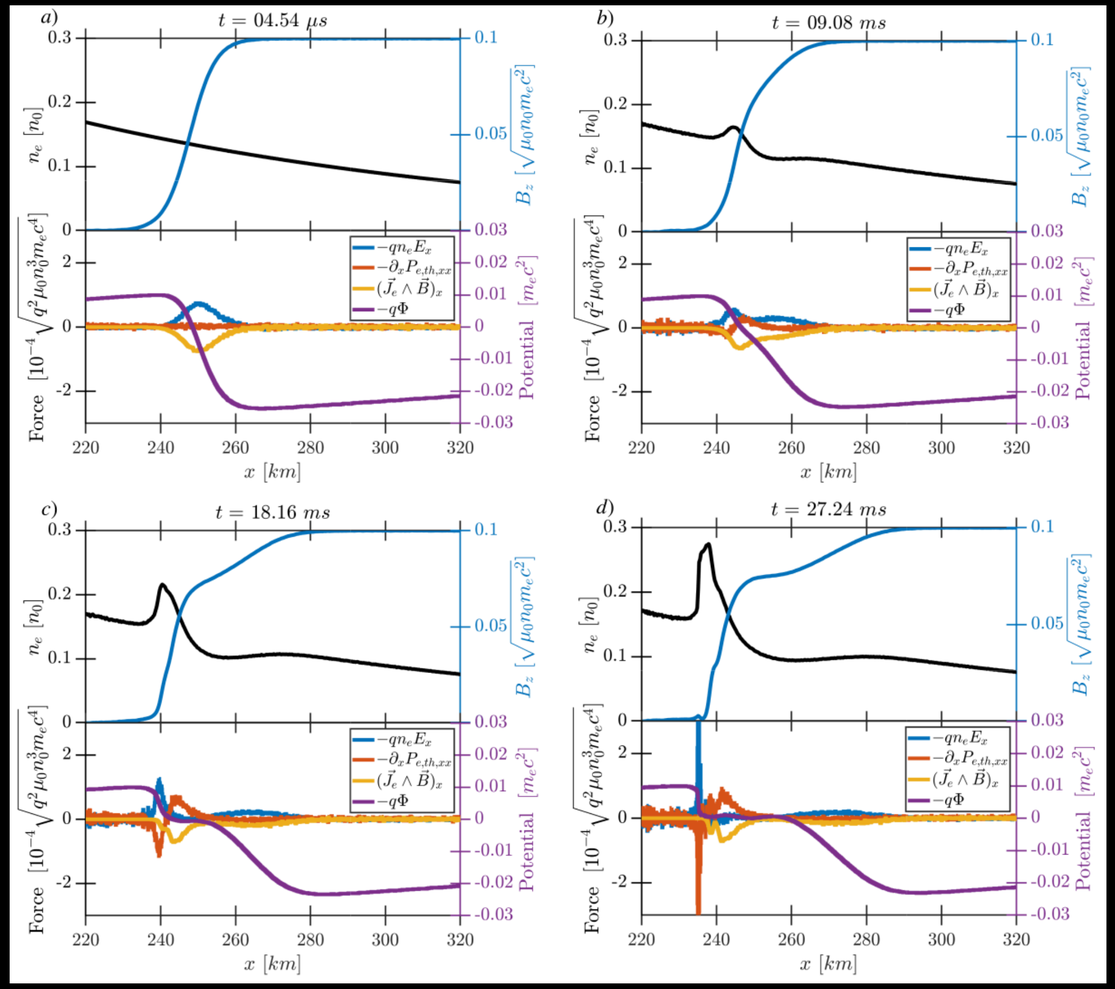


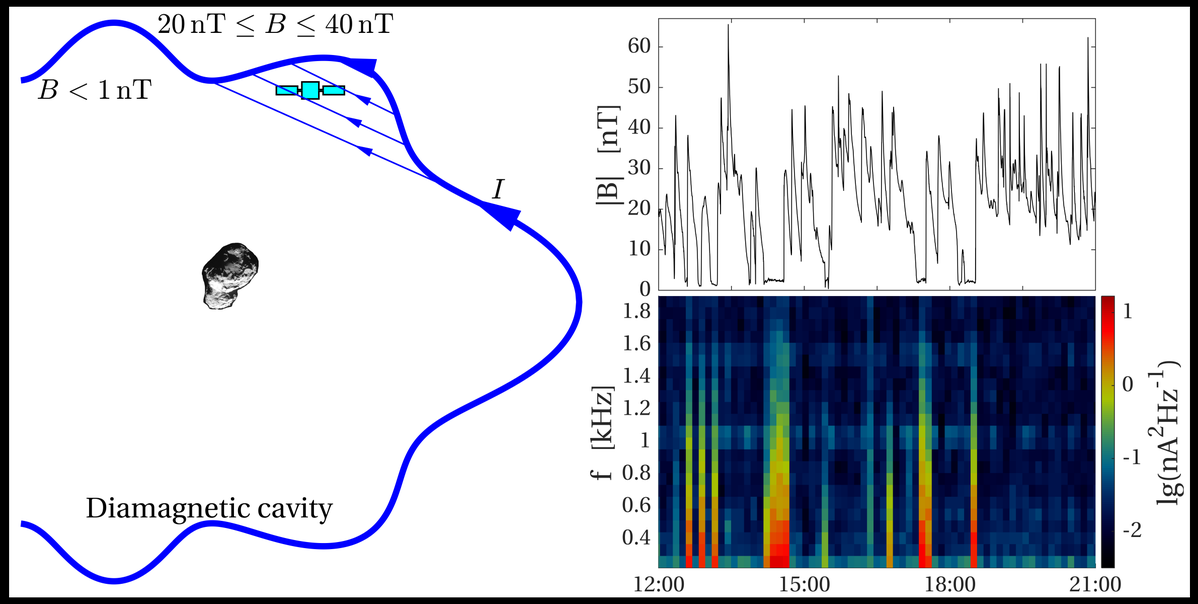


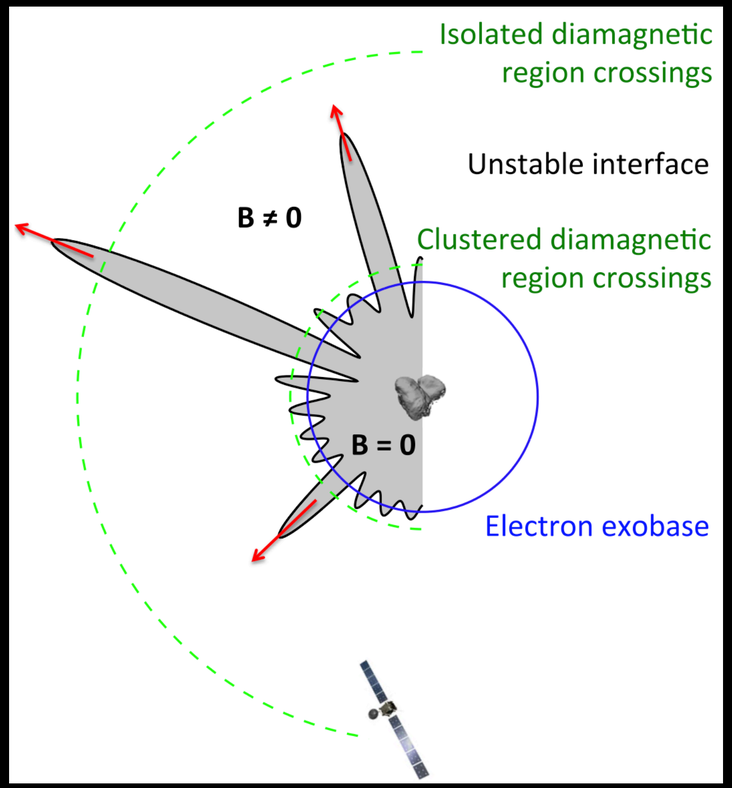
FULLY DEVELOPED BOW SHOCK
SOLAR WIND ION CAVITY
DIAMAGNETIC CAVITY

The diamagnetic cavity

Rosetta observations







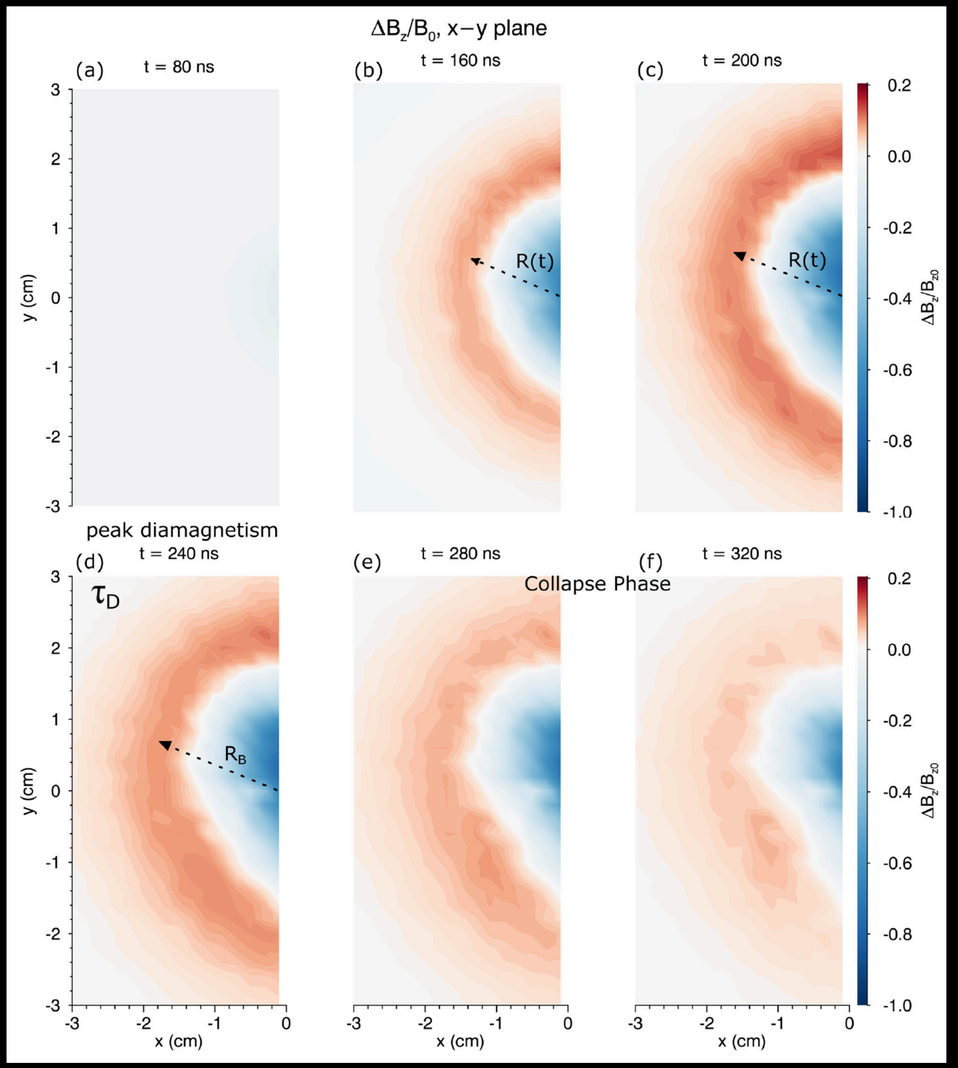
Beth et al. (2022)

Henri et al. (2017)

Goetz et al. (2022)

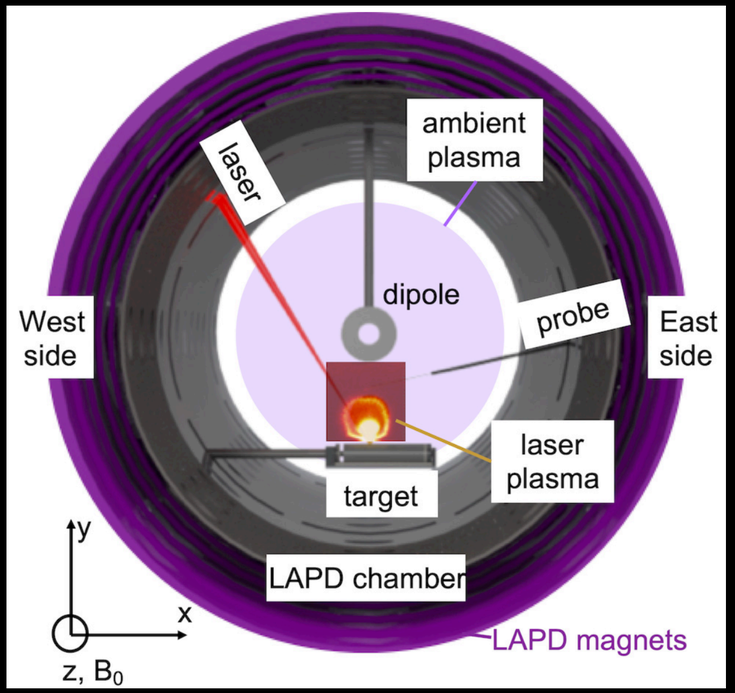
The diamagnetic cavity

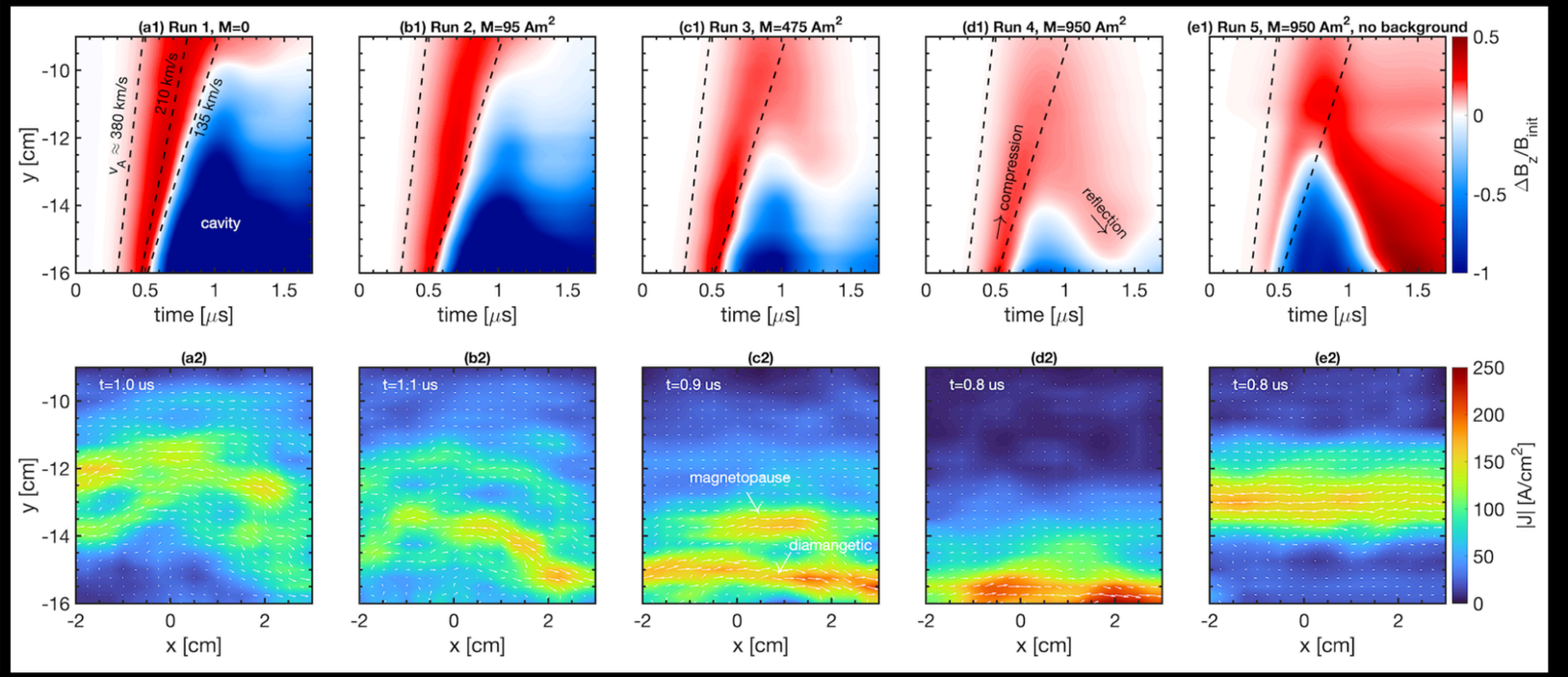
Lab connection



Pictures from Bonde et al. (2018)

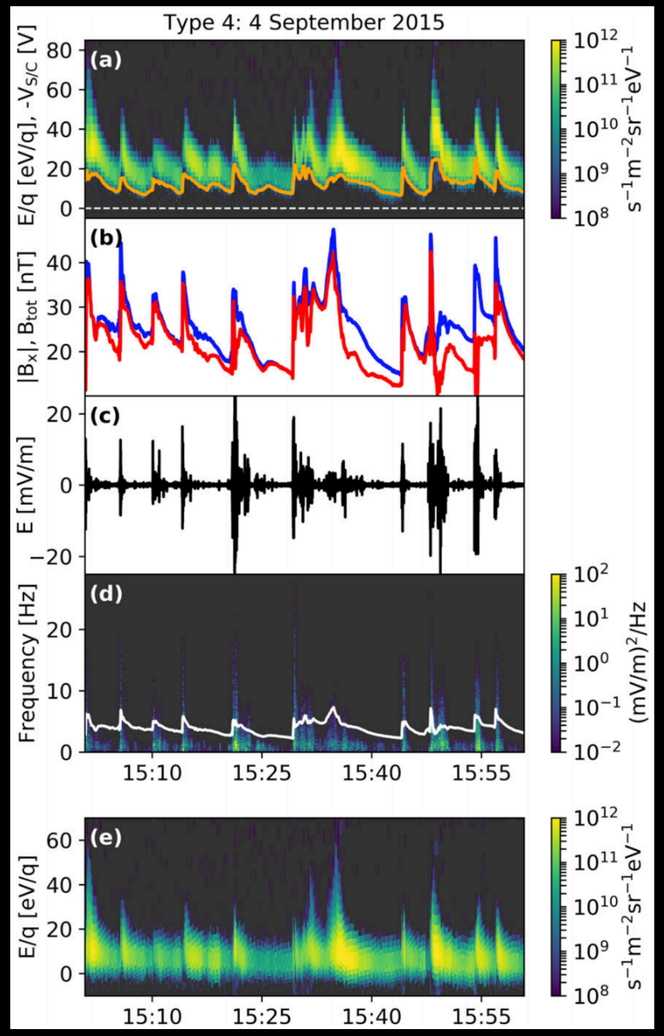
and Schaeffer et al. (2022)



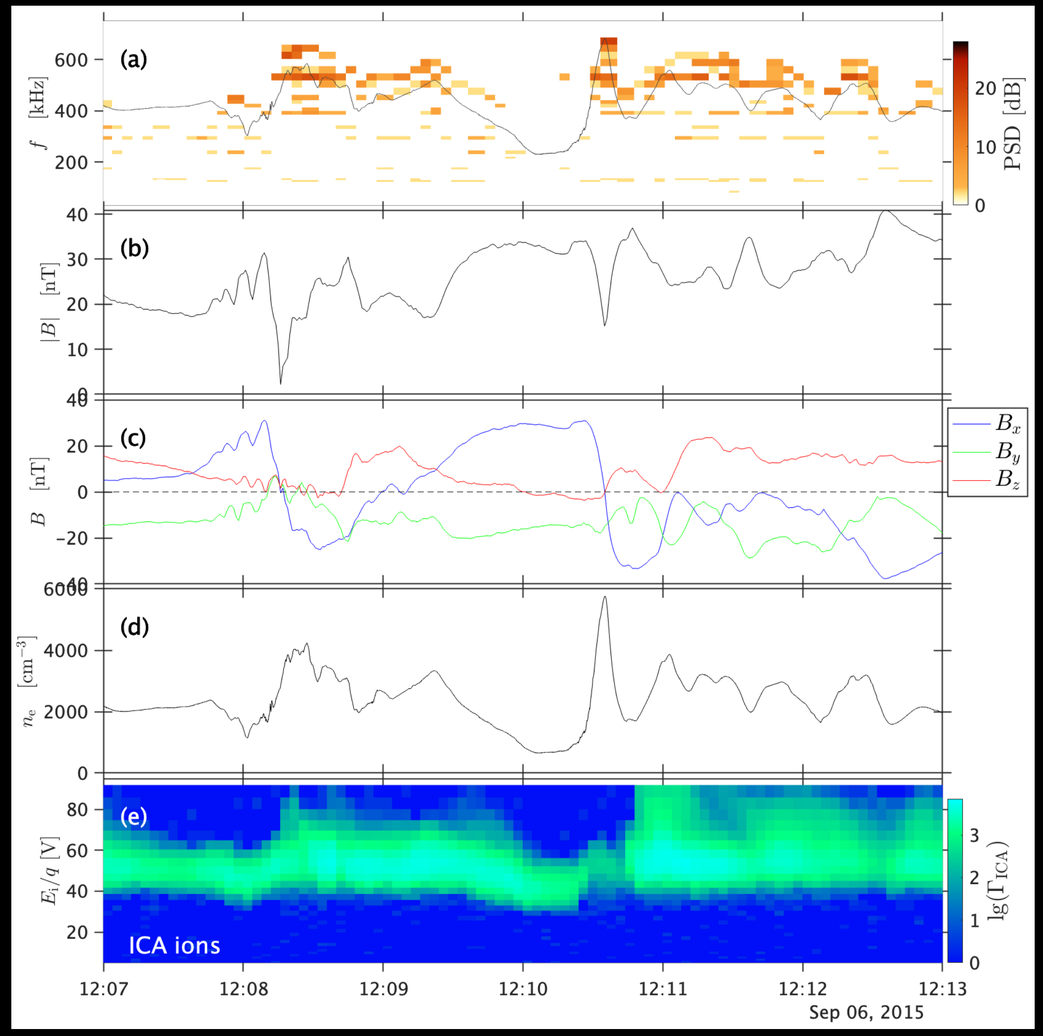


Steepened waves

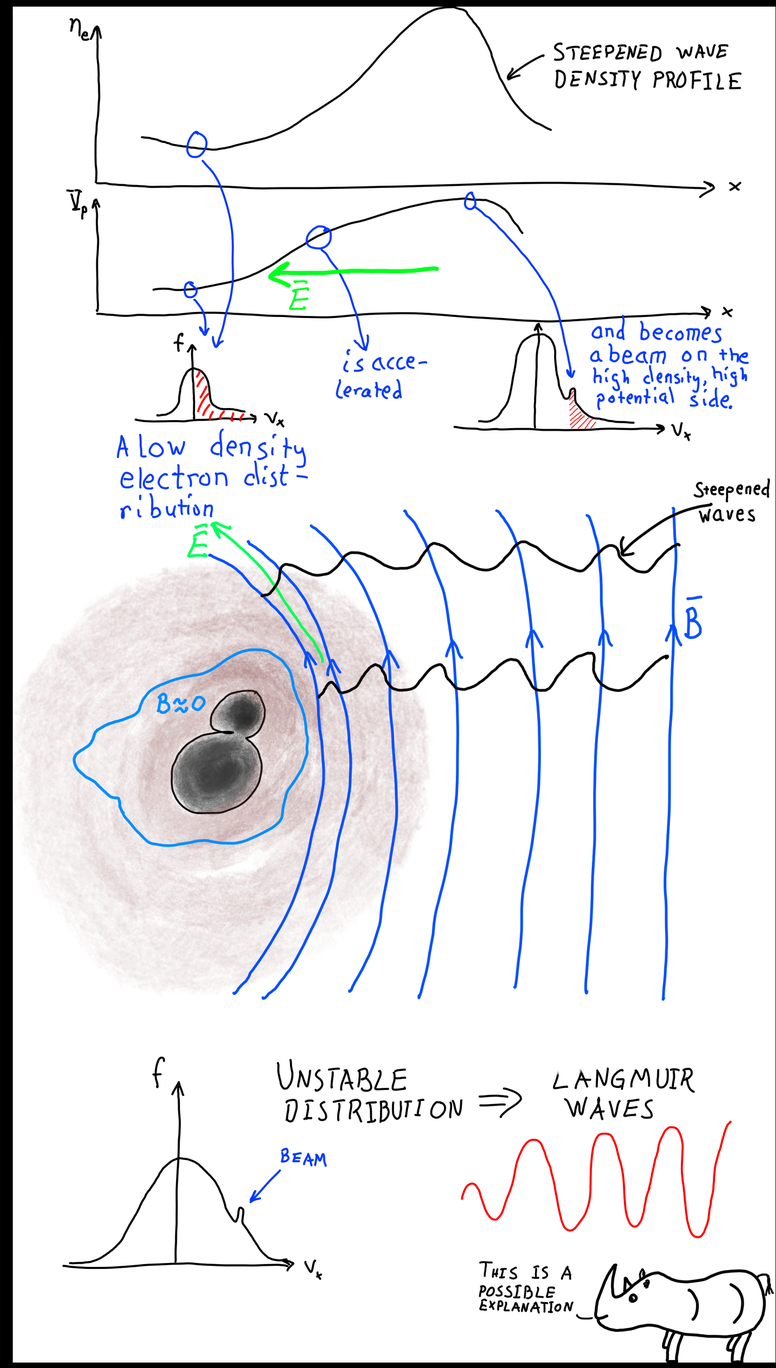
And Langmuir waves too



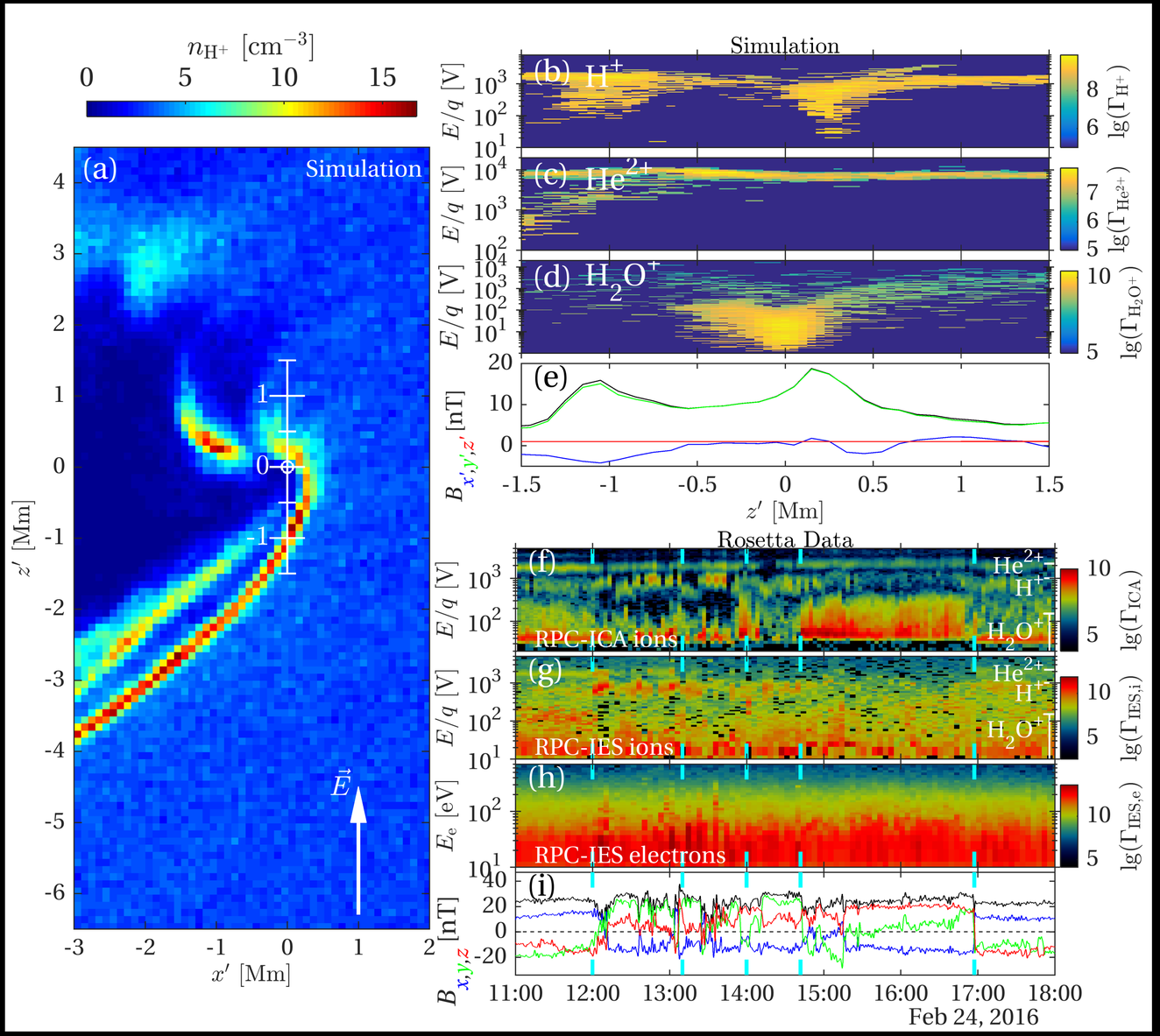
Stenberg Wieser et al. (2017)

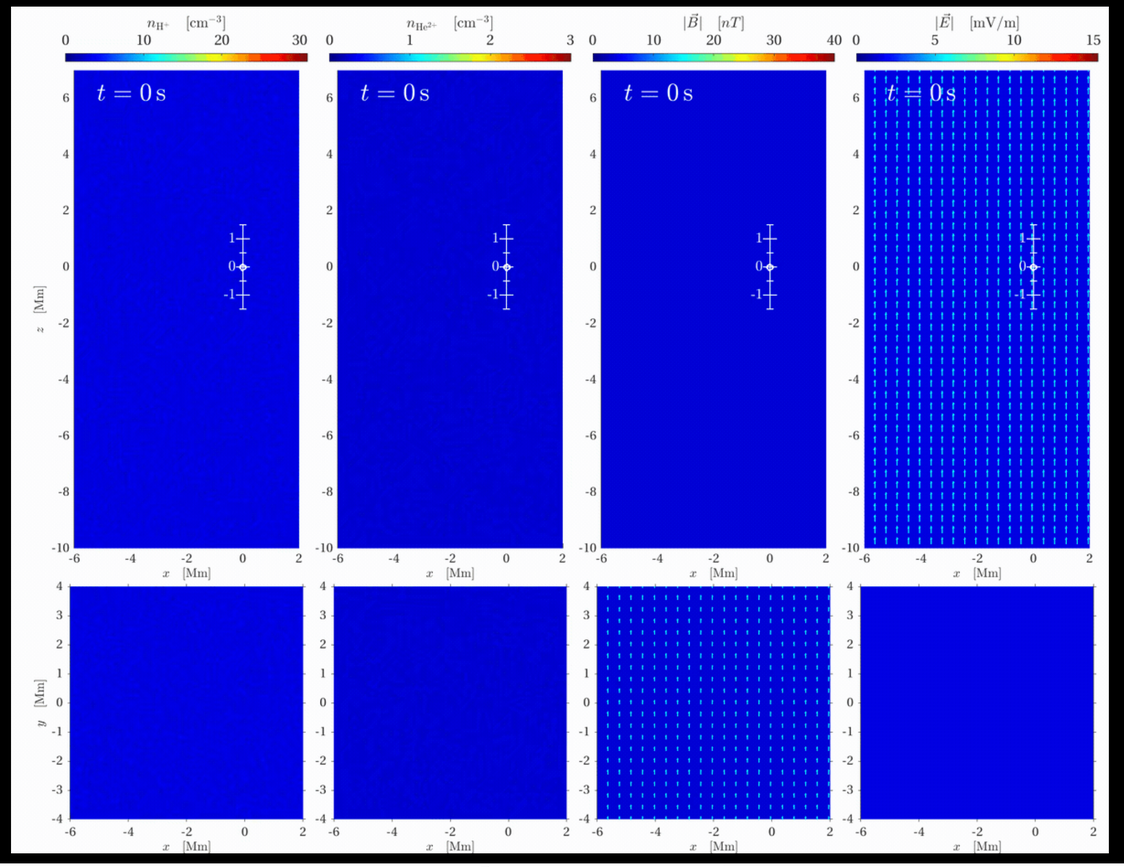


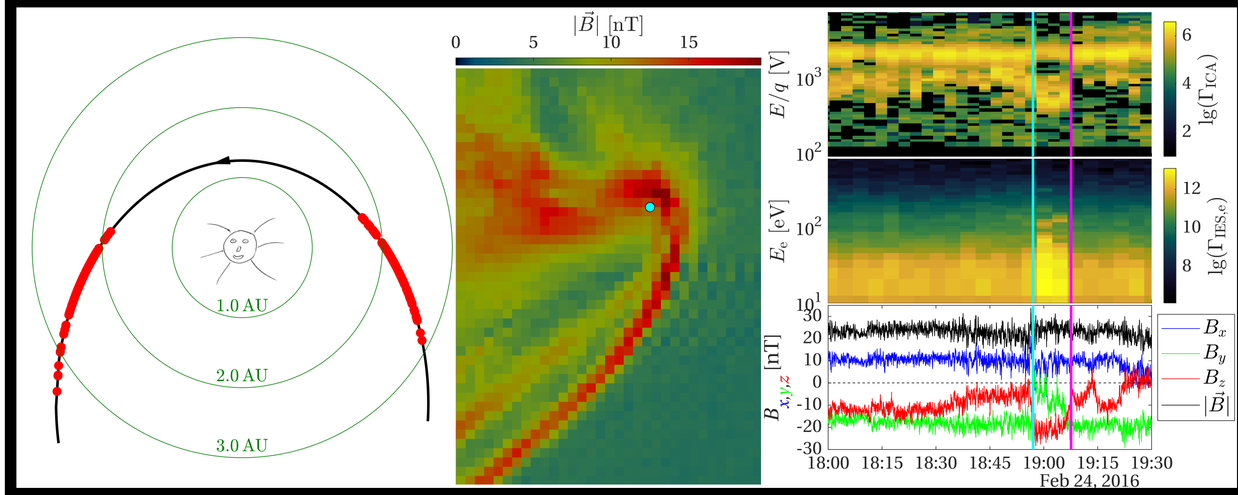
Gunell et al. (2025)



The Infant Bow Shock

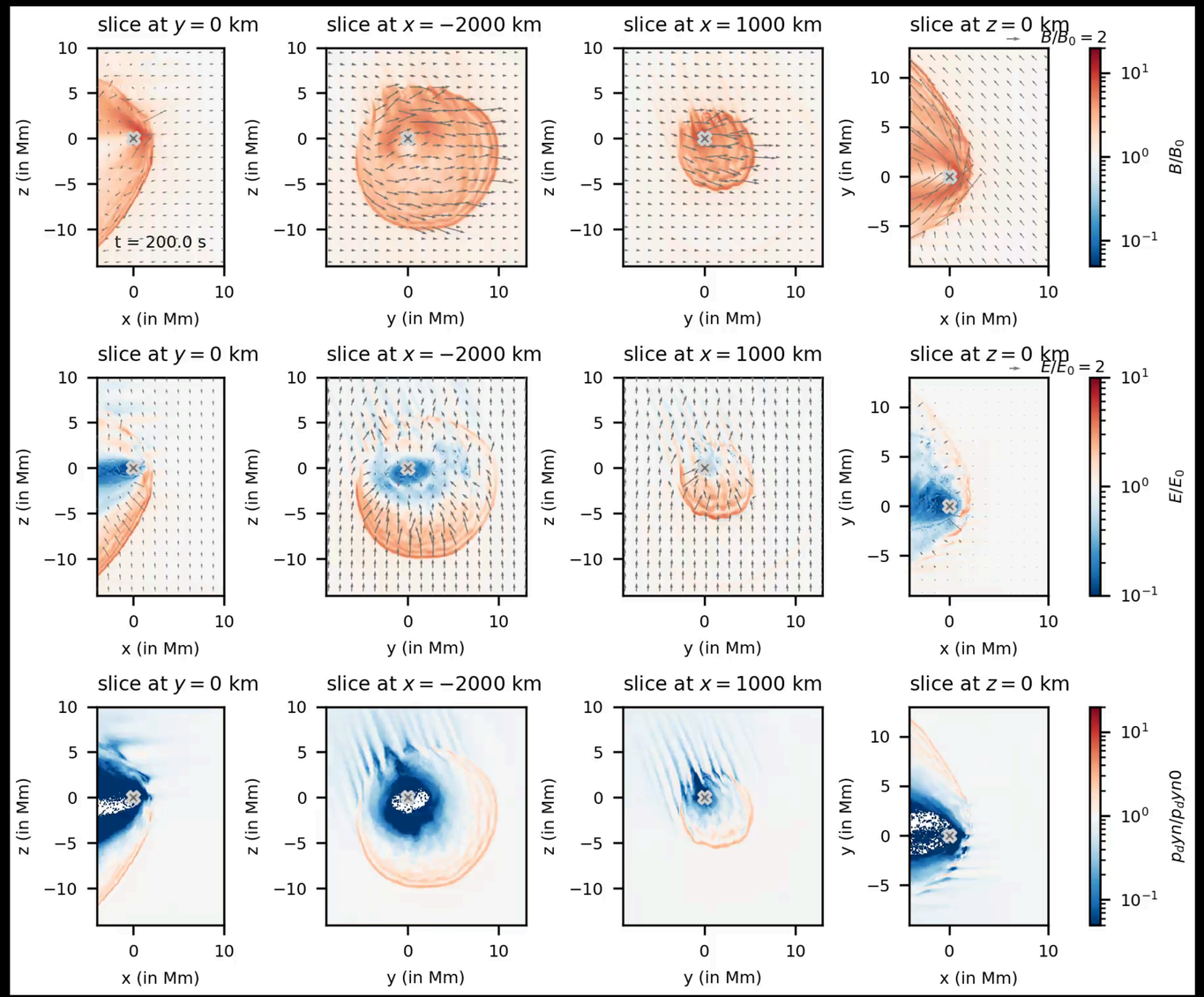


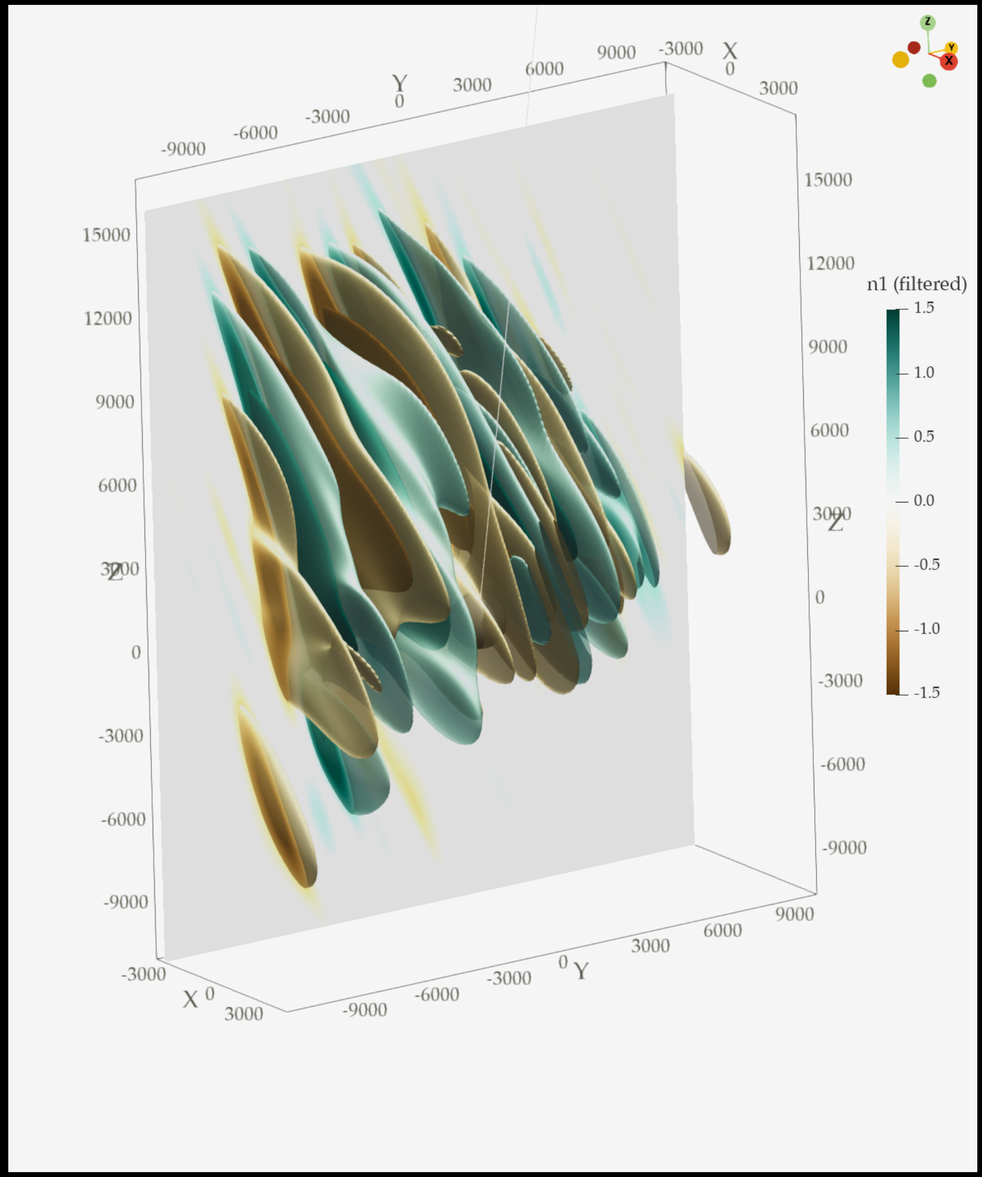




Gunell et al. (2018), Goetz et al. (2022)

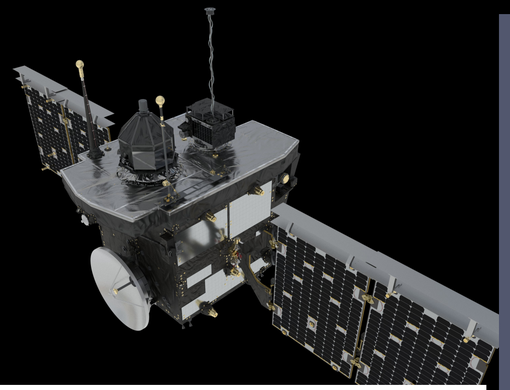
Singing comet waves?

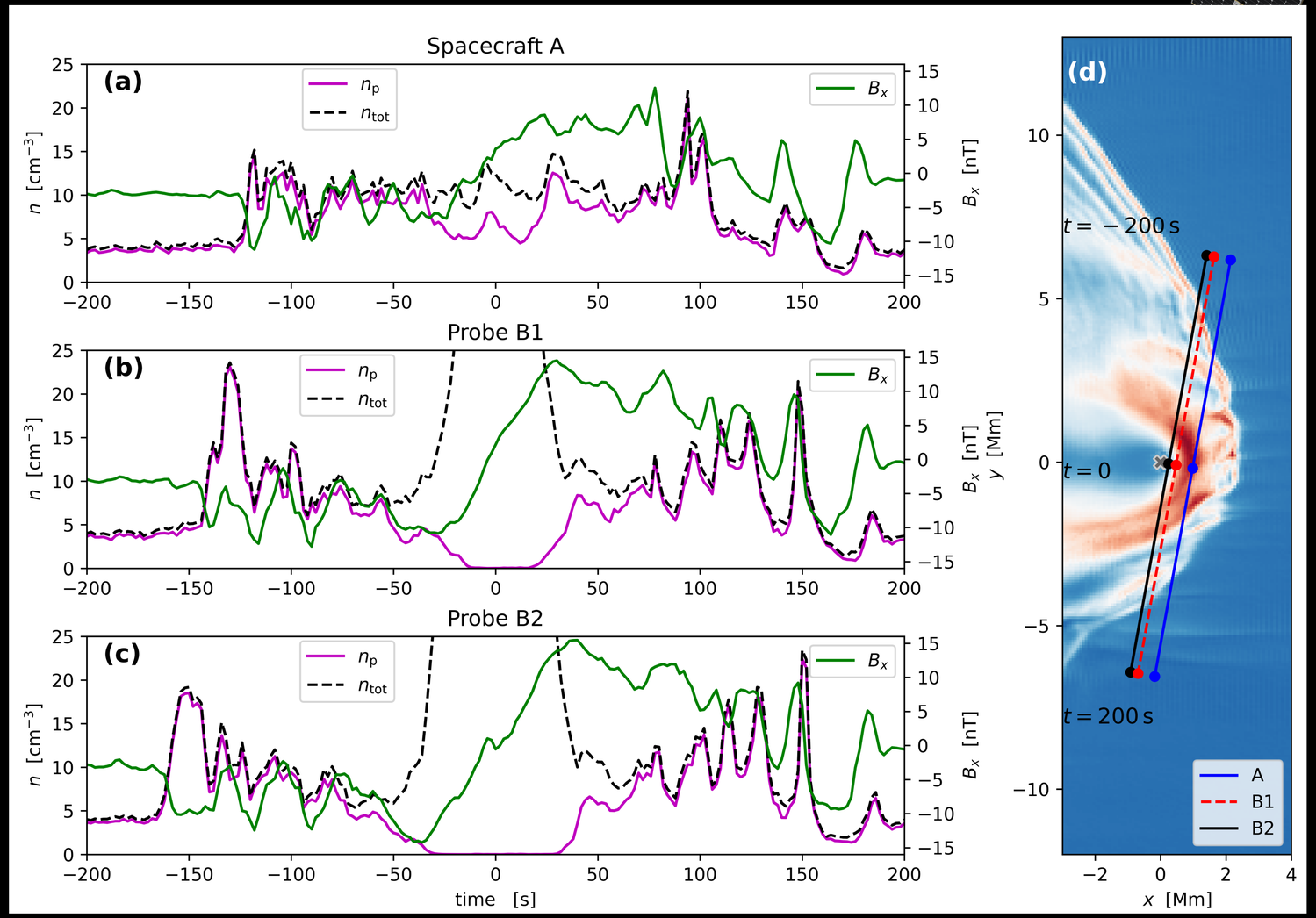


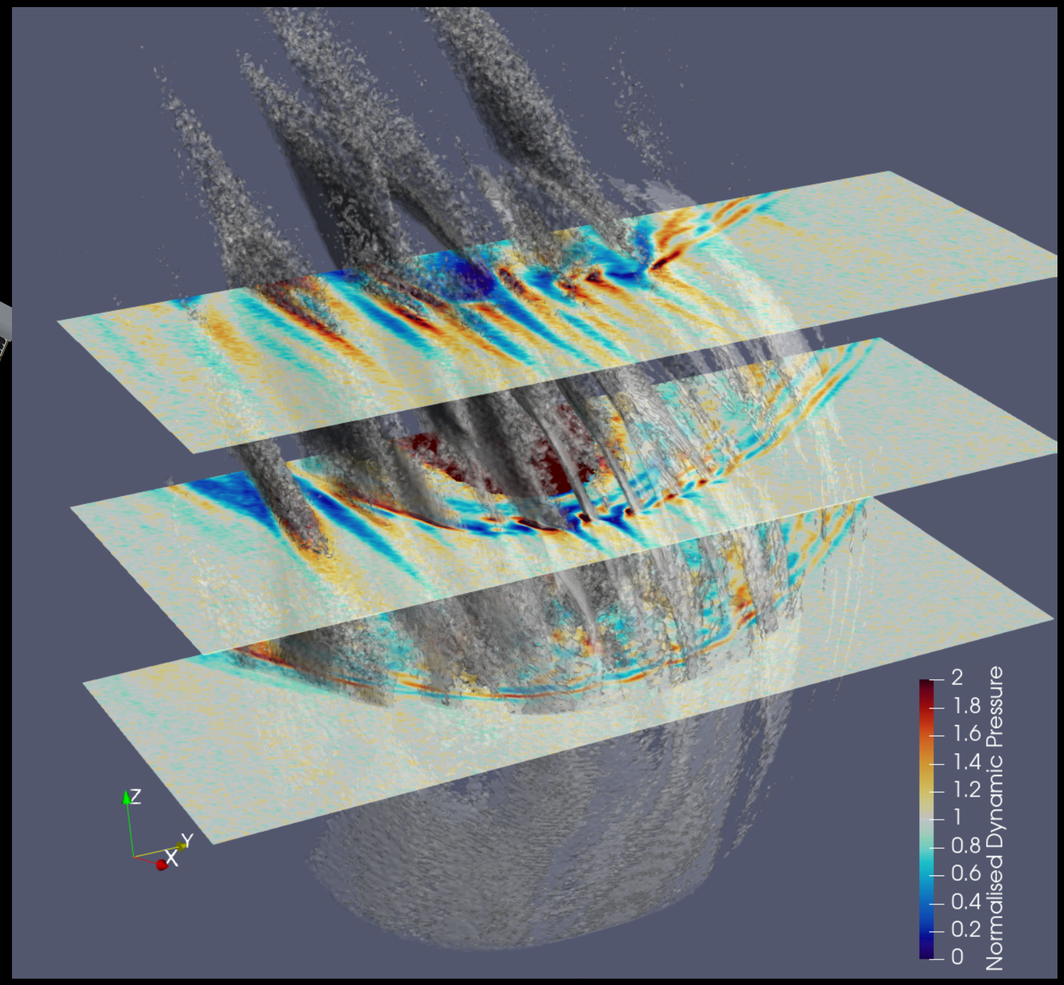


Moeslinger et al., in preparation (2026)

Jets







Gunell et al., in preparation (2026)

The questions in Luca's email

- What are your research interests in the area of turbulence and kinetic processes?
  Waves, shocks, cavities, and jets at comets

- Where do you see synergies between your research and other plasma-physics communities?
  Things could be learned from laser—plasma experiments