次期太陽観測衛星

Solar-C_EUVST

JAXA Epsilon M-class mission

A fundamental step towards answering how the plasma universe is created and evolves, and how the Sun influences the Earth and other planets in our solar system

Science objectives;

I. Understand how fundamental processes lead to the formation of the dynamic solar atmosphere and the solar wind

II. Understand how the solar atmosphere becomes unstable, releasing the energy that drives solar flares and eruptions

Close connection to

- **Astrophysics**
- **Plasma physics**
- **Geo-space physics (Space weather)**

Strategy;

Quantify the processes of mass loading and energy transport / conversion at work

Key features (not ever done);

A) ***Wide T-coverage*** (10^4-10^7 K)

Observe the whole regimes of the solar atmosphere as a single, coupled system

B) ***High resolution*** (spatial ~ 0.4”, temporal ~ 1 sec)

Capture the dynamic evolutions of elementary structures

C) ***Spectroscopy***

Determine the physical states of the targets

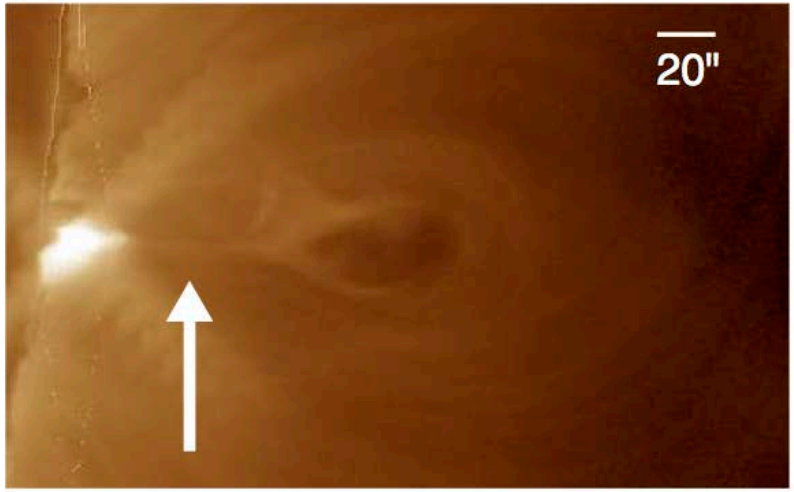
(V, ρ, T, composition, ionization)

~500kg in Sun-synchronous orbit

太陽物理学が解明すべき点
Sweet-Parker .vs. Petschek RX

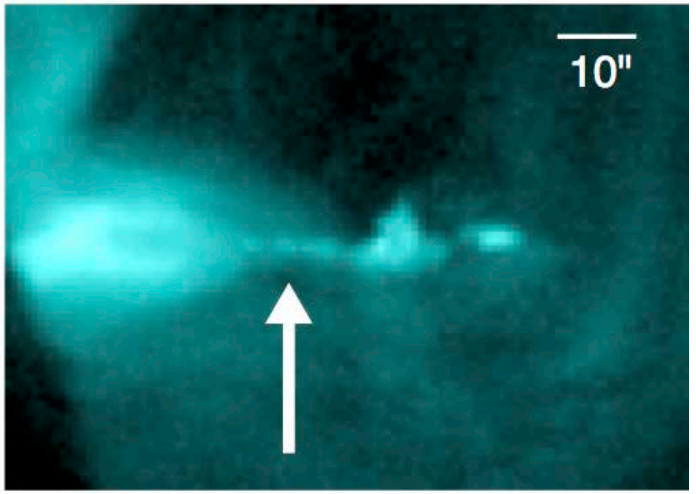
Warren et al. 2018

(A) Sheet structure without islands

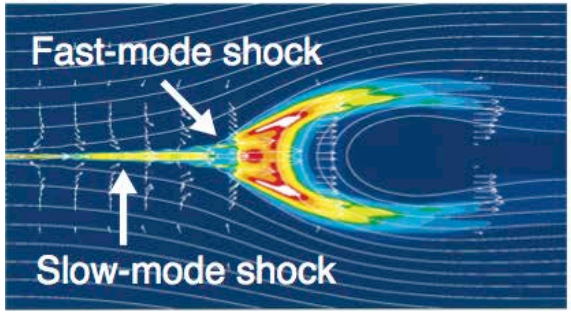


Takasao et al. 2012

(B) Sheet structure with islands

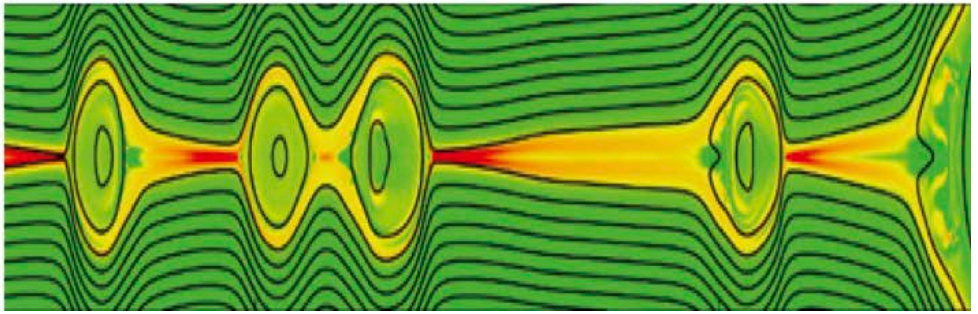


(C) Petschek reconnection



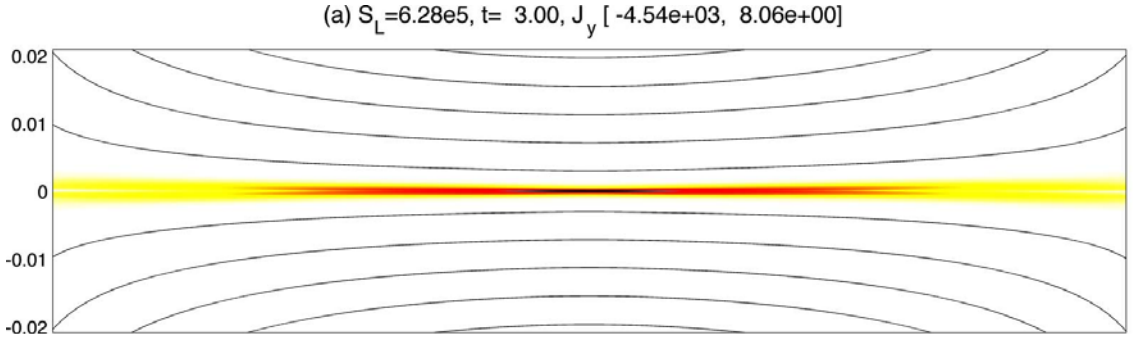
Yokoyama & Shibata 1996

(D) Plasmoid-unstable reconnection



Shibayama et al. 2015

太陽物理学が解明すべき点
Sweet-Parker(like) .vs. Petschek(like) RX



そう流的か乱流的かが違う？

N ~ magnetic islands number
assume N=100

V = Va~1000km/s
Δt = L / Va /N ~ 0.1s

D = (L/N)^2/Δt ~ 10^5 km^2/s diffusion equation

L ~ σ needs 100sec ~ ionization time scale

Multi-Ionization Condition???