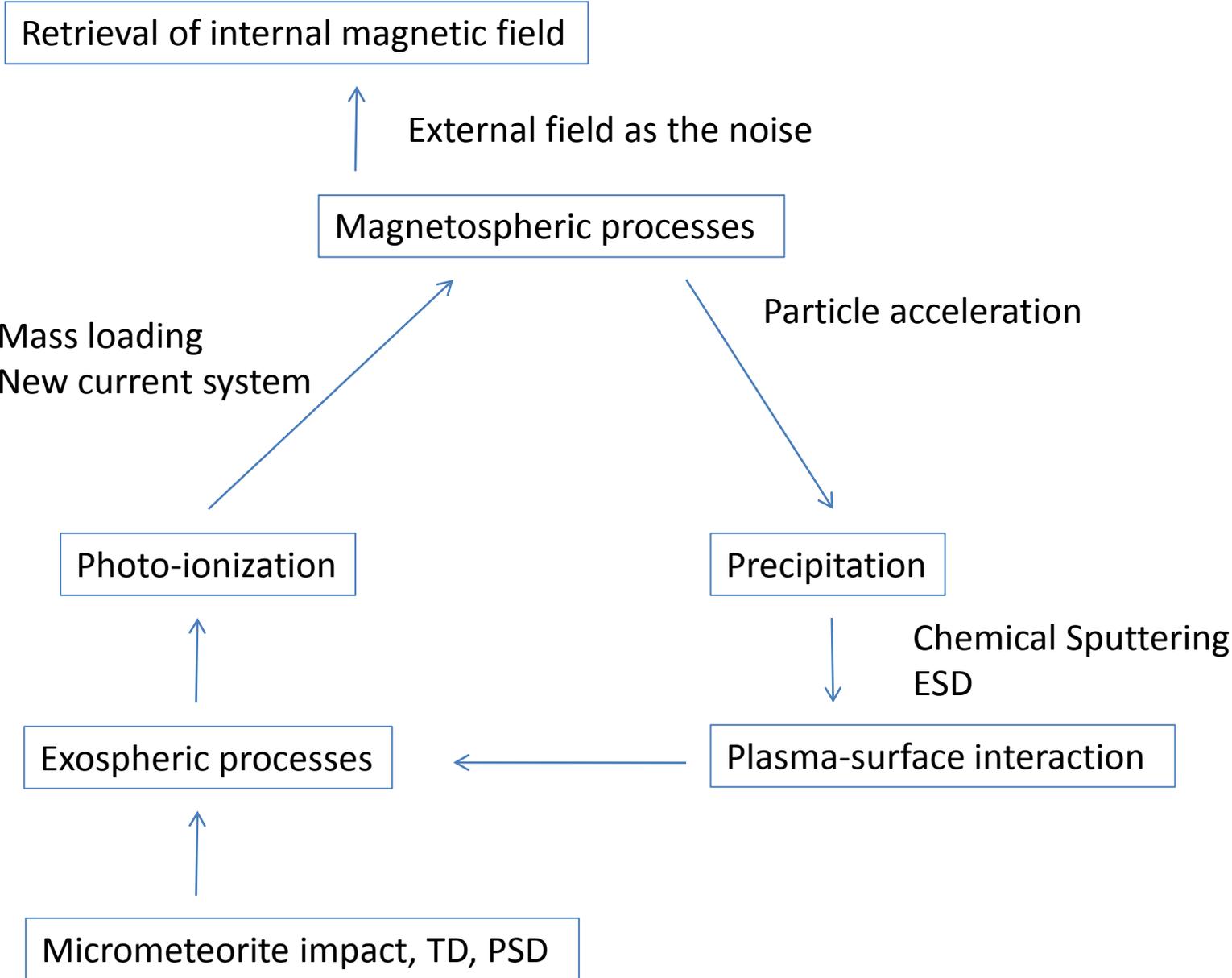


The workshop
from the space plasma physics
perspective

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Magnetospheric processes: “Why Mercury?”

- 1 Small size magnetosphere
- 2 Rich in heavy ions
- 3 Located in the inner heliosphere
- 4 Lack of the ionosphere

1 Small magnetosphere

2 Heavy ion rich

3 Located in the inner heliosphere

4 Lack of ionosphere

- 1: Deducing the kinetic-ness of the dynamics by structure function analysis
- 1 (+4?): Mercury more responsive to IMF Bz than any other planet due to high RX rate and short Dungey cycle period
- 1+3: IMF can fluctuate substantially before a Dungey cycle is completed
- 1+3: Cusp at equator, extreme events
- 1(+3+4?): The tail reconnection line position
- 1: No energetic electrons > 30 keV (but substantially amount are heated upto 10 keV)
- 1: Shabansky branching

1 Small magnetosphere

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- 2: Na⁺ ring close to the planet
- 2: Impact on boundary layer dynamics

- 2: Na⁺ seriously included in various modeling
- 2:Ca⁺ should be included
- 2: K⁺ problem @ Kaguya
- 1+2: Enough electrons for ESD

- 2: Not enough mass loading by Na⁺
- 2: The burning question: Which species, if any at all, are responsible for the mass loading?

1 Small magnetosphere

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- 1 (+4?): Mercury more responsive to IMF B_z than any other planet due to high RX rate and short Dungey cycle period
- 1(+3+4?): The tail reconnection line position at $X=-2R_M$?!
- 3: IMF B_x important

- 4: How is FAC carried?
- 4: Surface charging
- 4: Deducing the conductivity from E&B field observations in the magnetosphere

Upon collaborating with exospheric folks

- Can't (Shouldn't) include every details. Need to clarify what is the essential minimum.
- The items would depend on the project that you are working on.
Are you sure Na^+ is the right one for your project?!
- Example: In my case, I want to know (1) which species is most responsible for mass loading at the magnetopause altitude and (2) what is the mass density.

Modeling efforts

- Serious studies on (1) ionospheric boundary, (2) exospheric plasma source.
- Surface potential needs to be included in particle models?
- Fluctuating IMF
- I wish to see a nice process in which the positive feed back between a plasma particle acceleration & an exospheric source process is seen.

The plasma-surface interaction theme

- MR framework: Where space, solar and lab plasma people interested in Magnetic Reconnection get together.
 - Does it work for the plasma-surface theme?
- # Why was ESD overlooked? Because it is an ion source process?!

Internal magnetic field

- Removal of external field:
 - TS04 w/o RC is not satisfactory.
 - Had better concentrate on “clean” intervals.
 - Use MHD/Hybrid simulation results?!
- # Na⁺ ring close to the planet.