

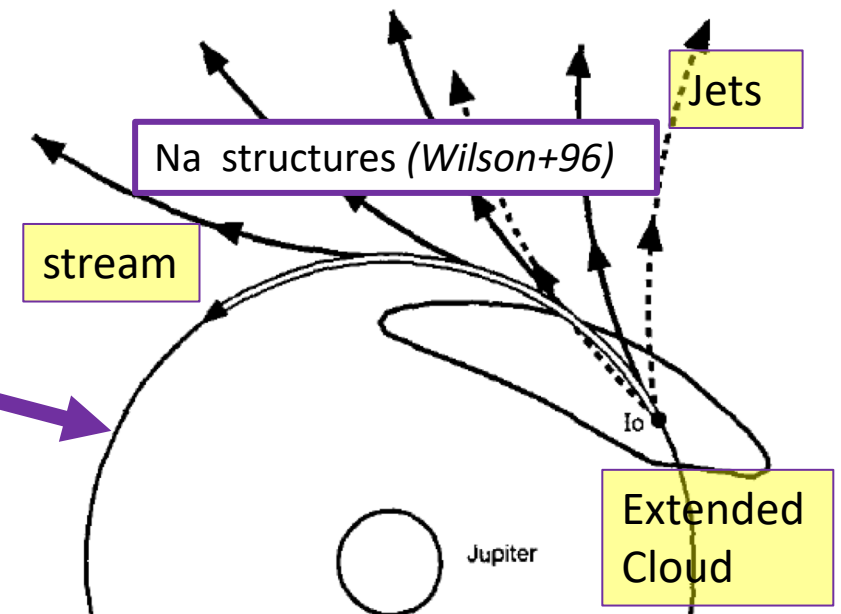
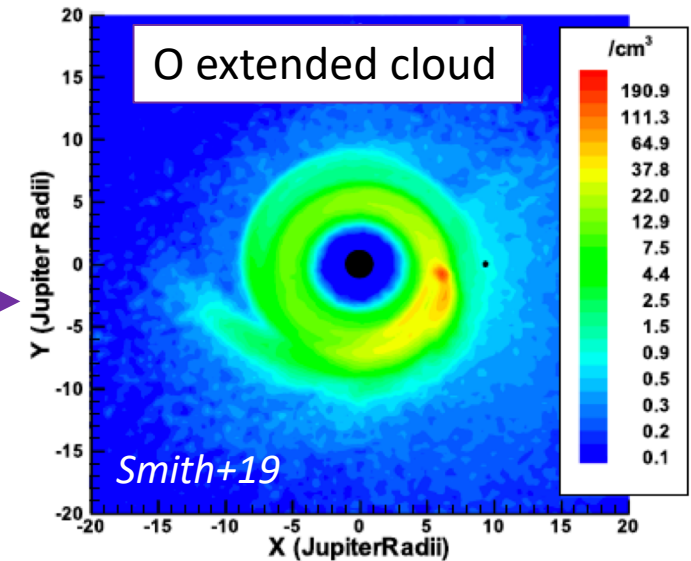
Io's loss of neutral material: Numerical simulations

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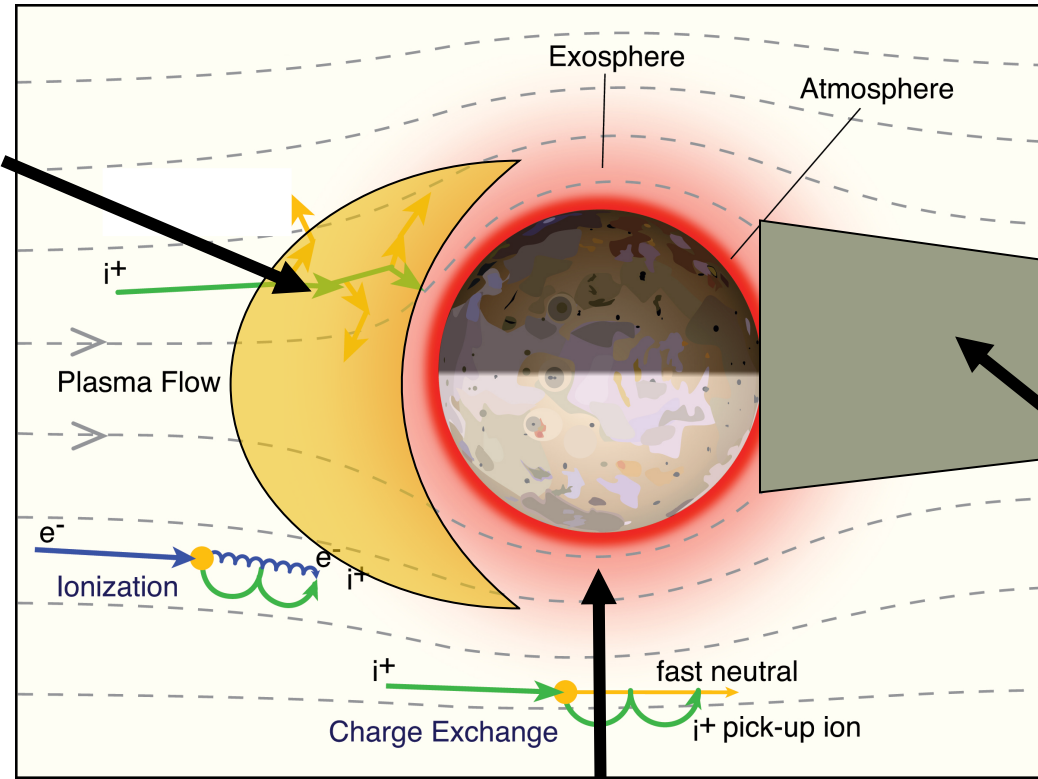
GOAL: model neutral sources from Io's atmosphere and corona

MOTIVATION:

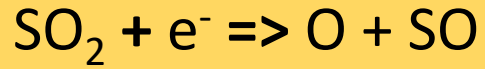
- Source of **extended clouds** in S, O, SO₂ as input of neutral cloud models (Smyth+92; Smith+19; Koga+18)
- S and O ions detected in **Jupiter's equatorial atmosphere** by Juno in Jupiter's equatorial regions (Valek+19)
- Voyager detection of SO₂⁺ in the **cold torus** (Bagenal85)
- Galileo detection, far from Io, of **EMIC** waves at SO₂⁺ gyrofrequencies (Russell+03)
- **Motivate** observations of neutral structures **similar to Na?**
 - O and S jets? (C. Schmidt+AGU15)
 - SO₂ extended cloud? (ALMA ?)
 - SO₂, S&O Mendillo-discs? (Krimigis+02)



RESULTS: Some rates are very large: where do the ejected neutrals go?



e-impact SO₂ dissociation



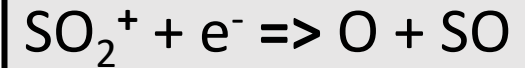
~ 1,500 kg/s

Slow S&O neutrals

Source of: S&O corona

S&O extended clouds?

Recombinative-dissociation of SO₂⁺



~ 300 kg/s

Fast S&O

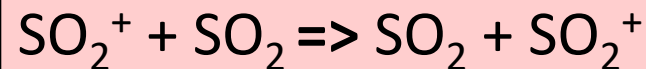
Source of: S and O jets?

Asy-chex with SO₂



small amount

SO₂ resonant charge-exchange



~ 1,000 kg/s

Fast to slow SO₂, depending on local flow

Source of: Jets? Mendillo-disc? Banana cloud?