

Happy Birthday, Mars Express!



Gabriella Stenberg, IRF, Kiruna



One upon a time...

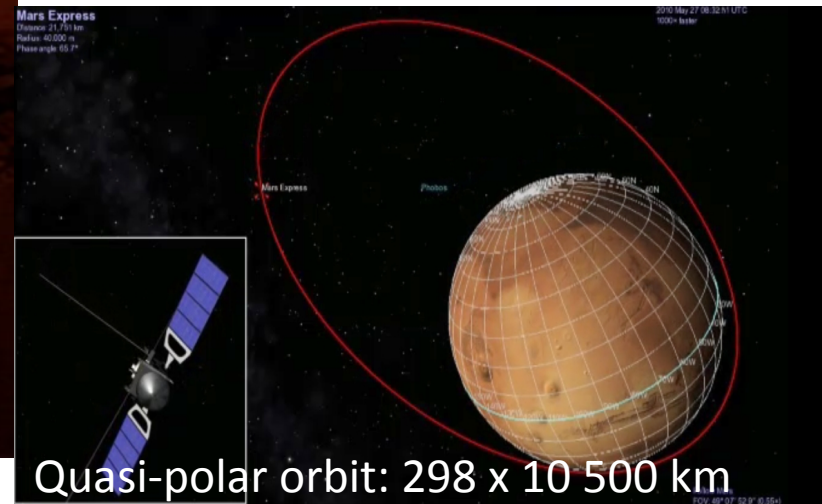
..we went..



..to Mars..

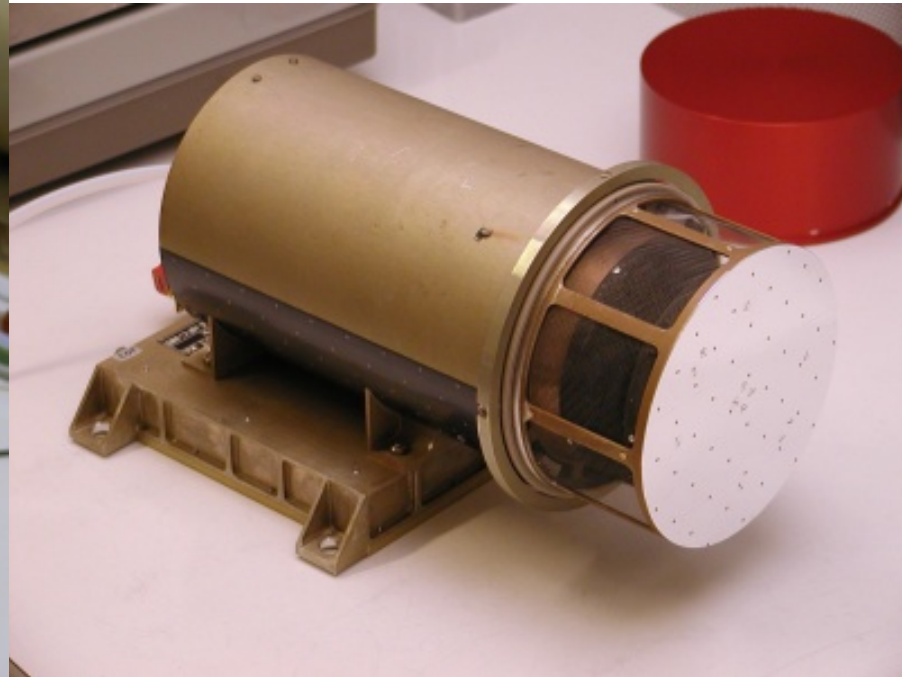
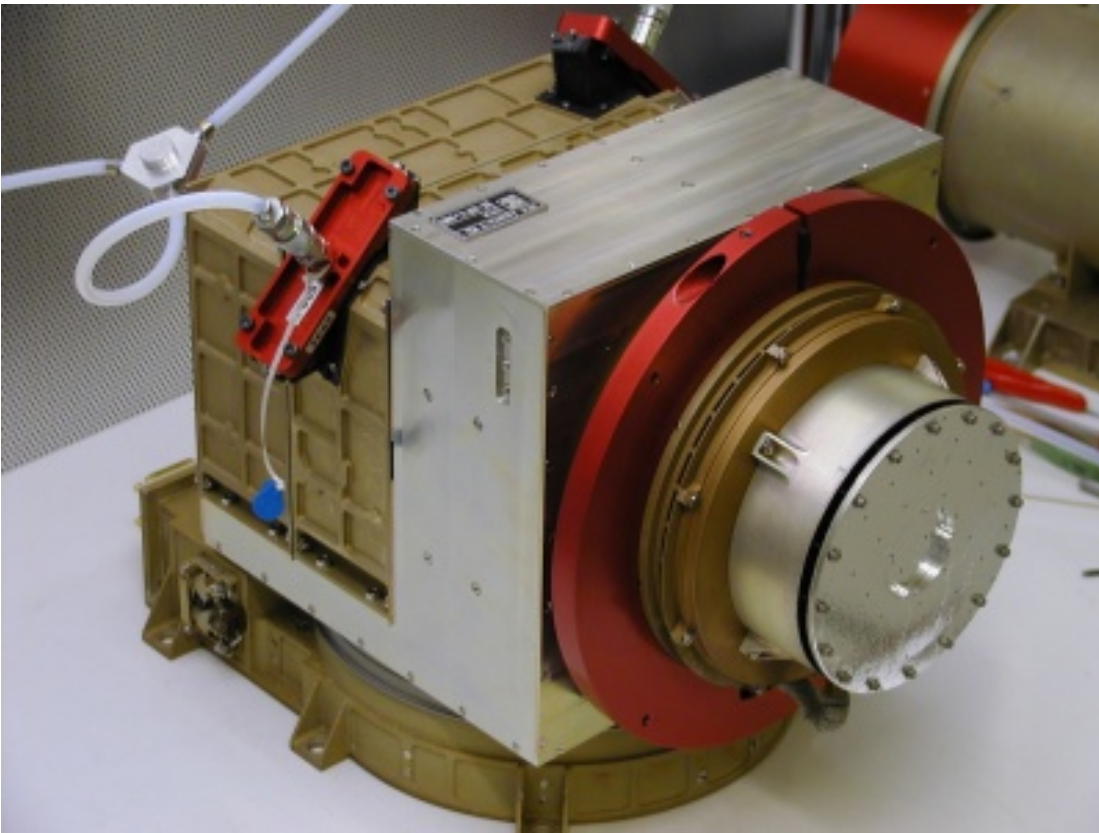


..to stay 1 Martian year.



...and we are still there!

Our contribution 1: ASPERA-3



Our contribution 2: Publications

2004

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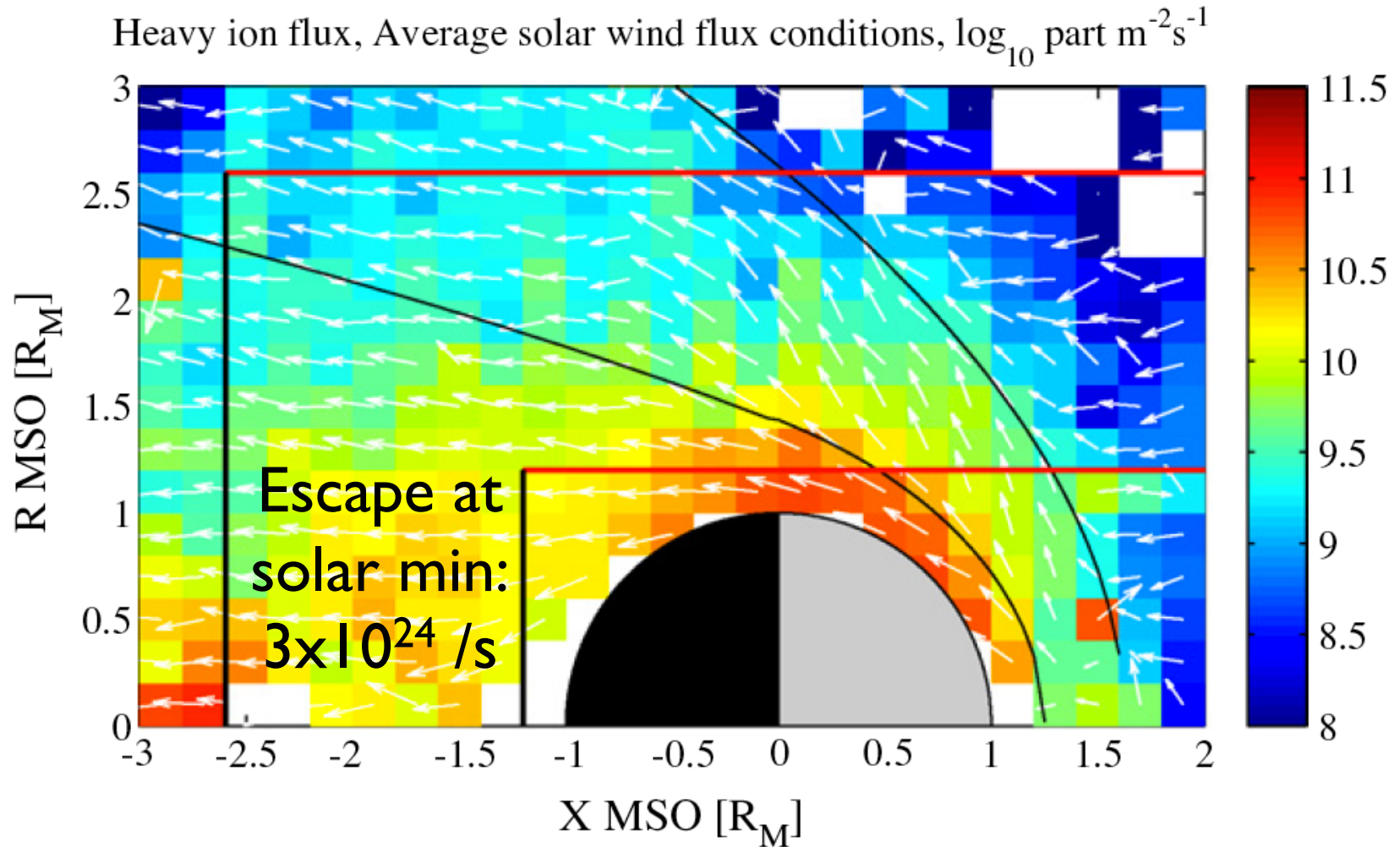
Fedorov, A., E. Budnik, J.-A. Sauvaud, C. Mazelle, S. Barabash, R. Lundin, M. Acuña, M. Holmström, A. Grigoriev, M. Yamauchi, H. Andersson, et al., Structure of the martian wake, *Icarus*, 182, 2, 329-336, 2006.

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....and many more!

Atmospheric outflow



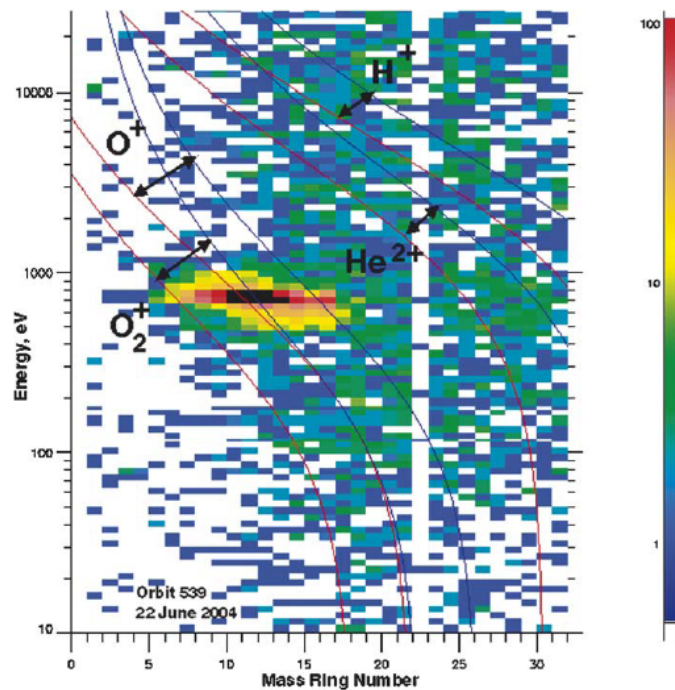
Nilsson et al. 2011

More atmospheric outflow

Composition

Composition of the heavy escape flow

$\text{CO}_2^+ / \text{O}^+ = 0.2$ and $\text{O}_2^+ / \text{O}^+ = 0.9$.

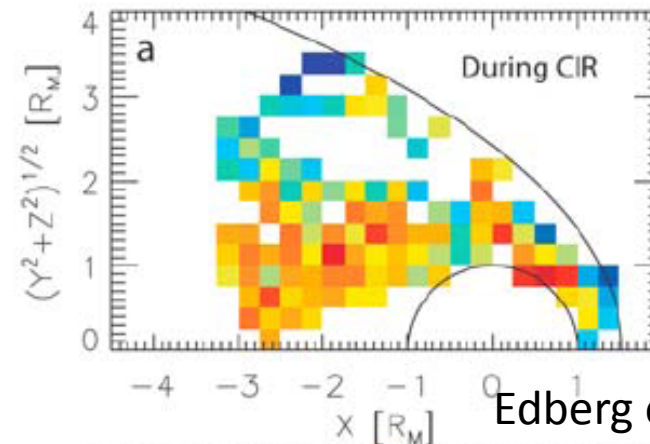


Carlsson et al., 2006

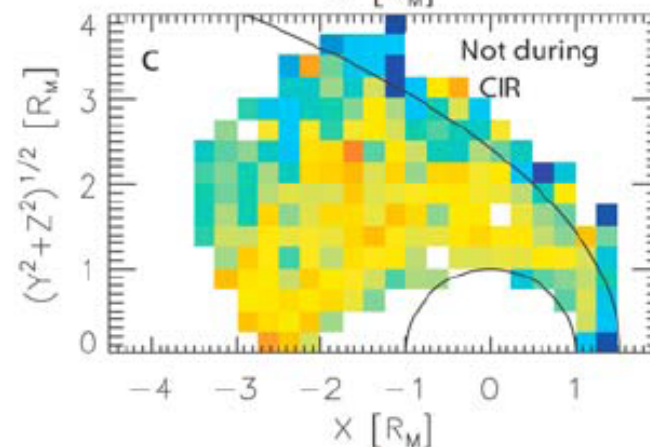


Variations

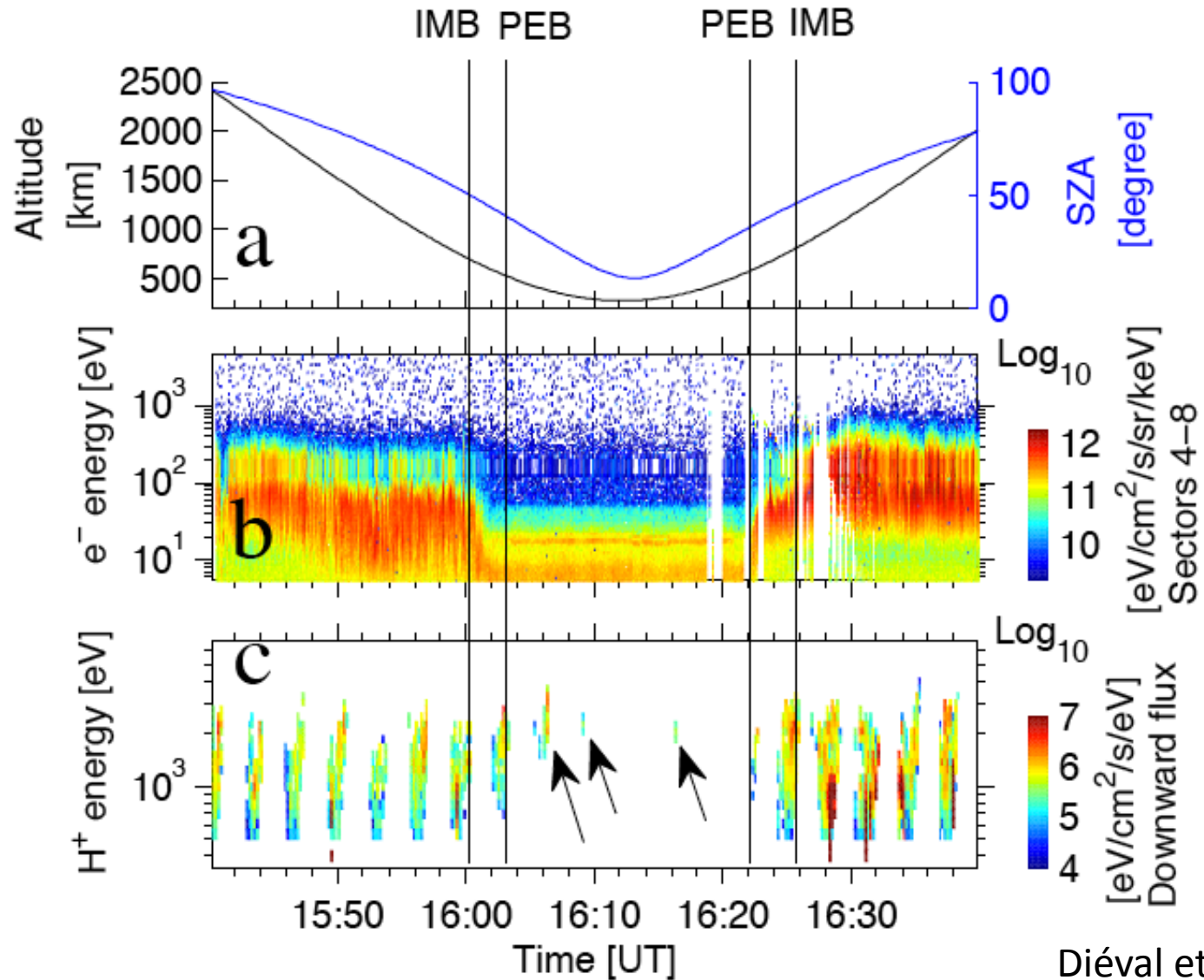
Escape during CME/CIR increases ~ 2.5



Edberg et al., 2010



Solar wind precipitation



Martian Aurora

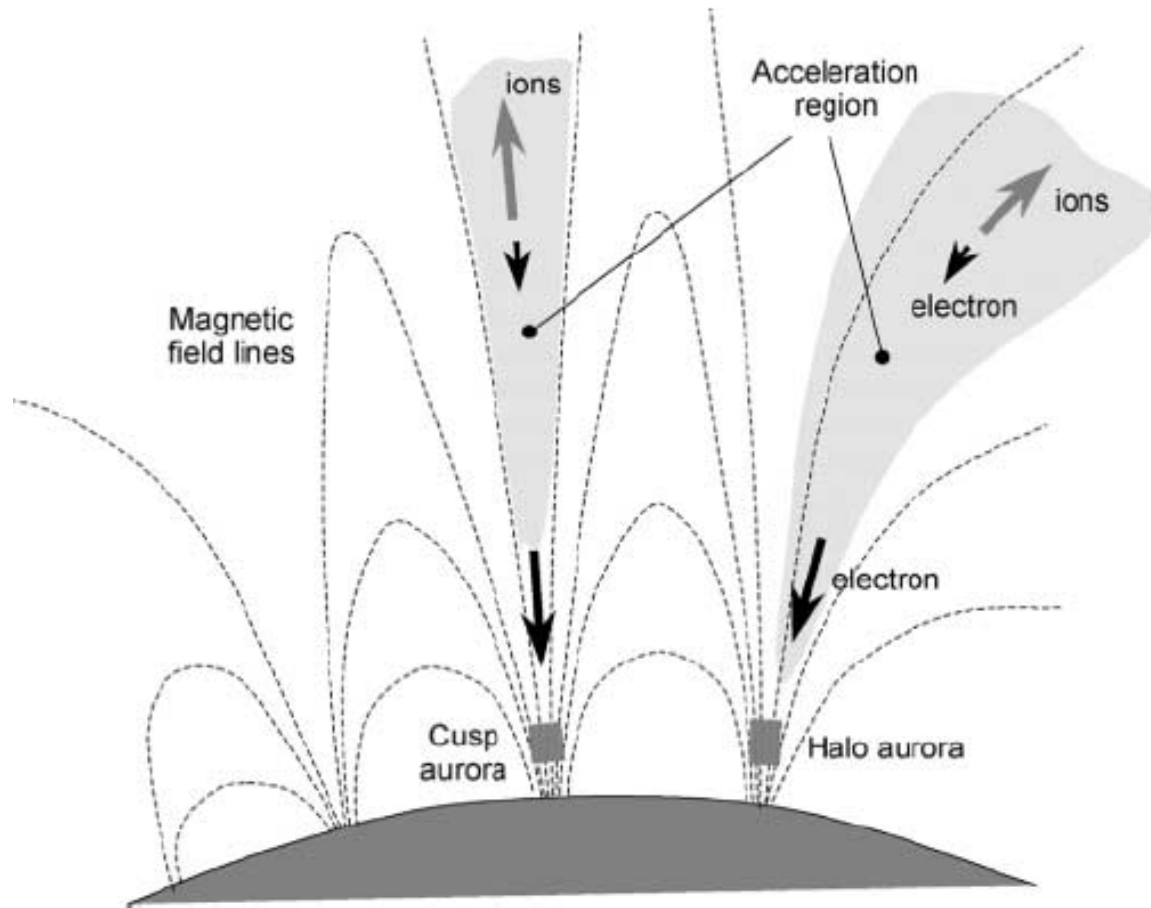
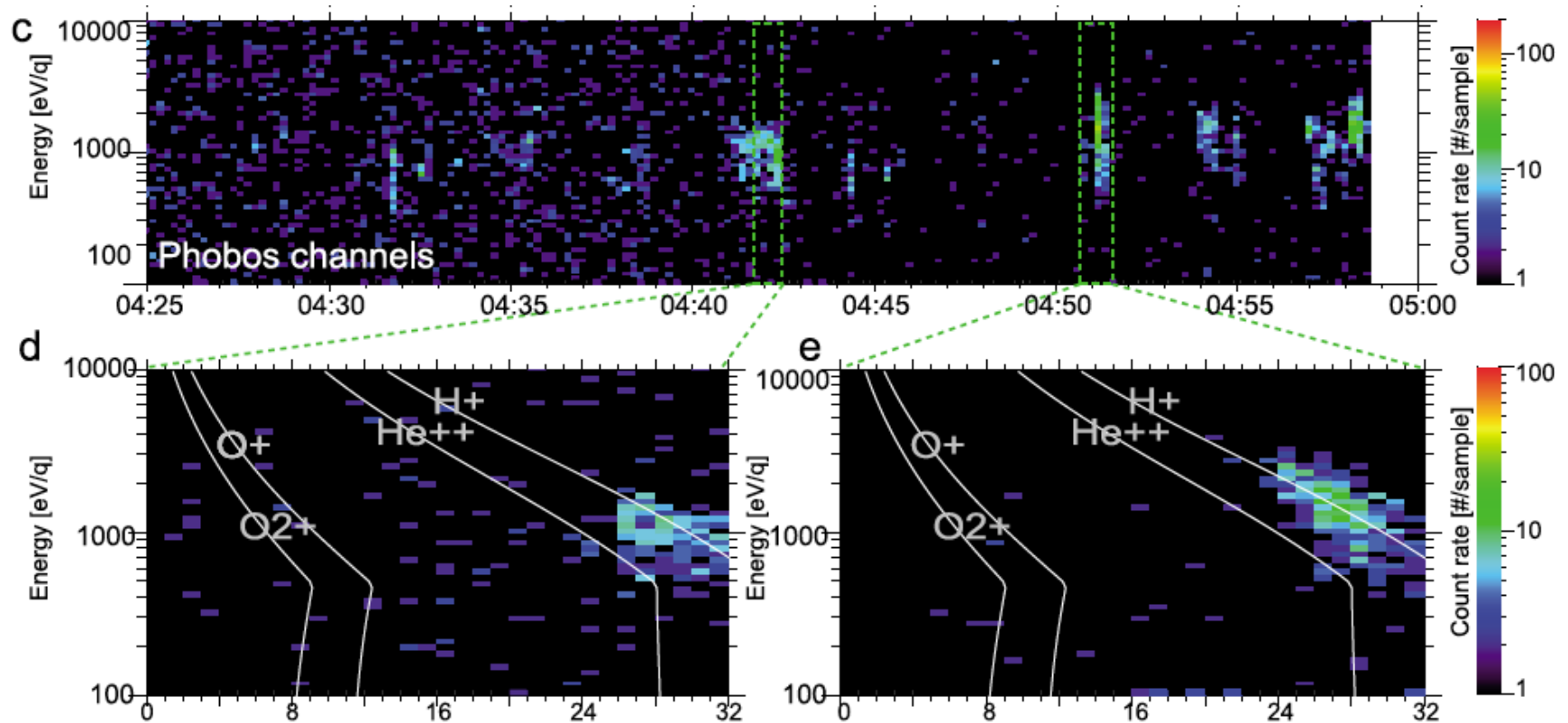


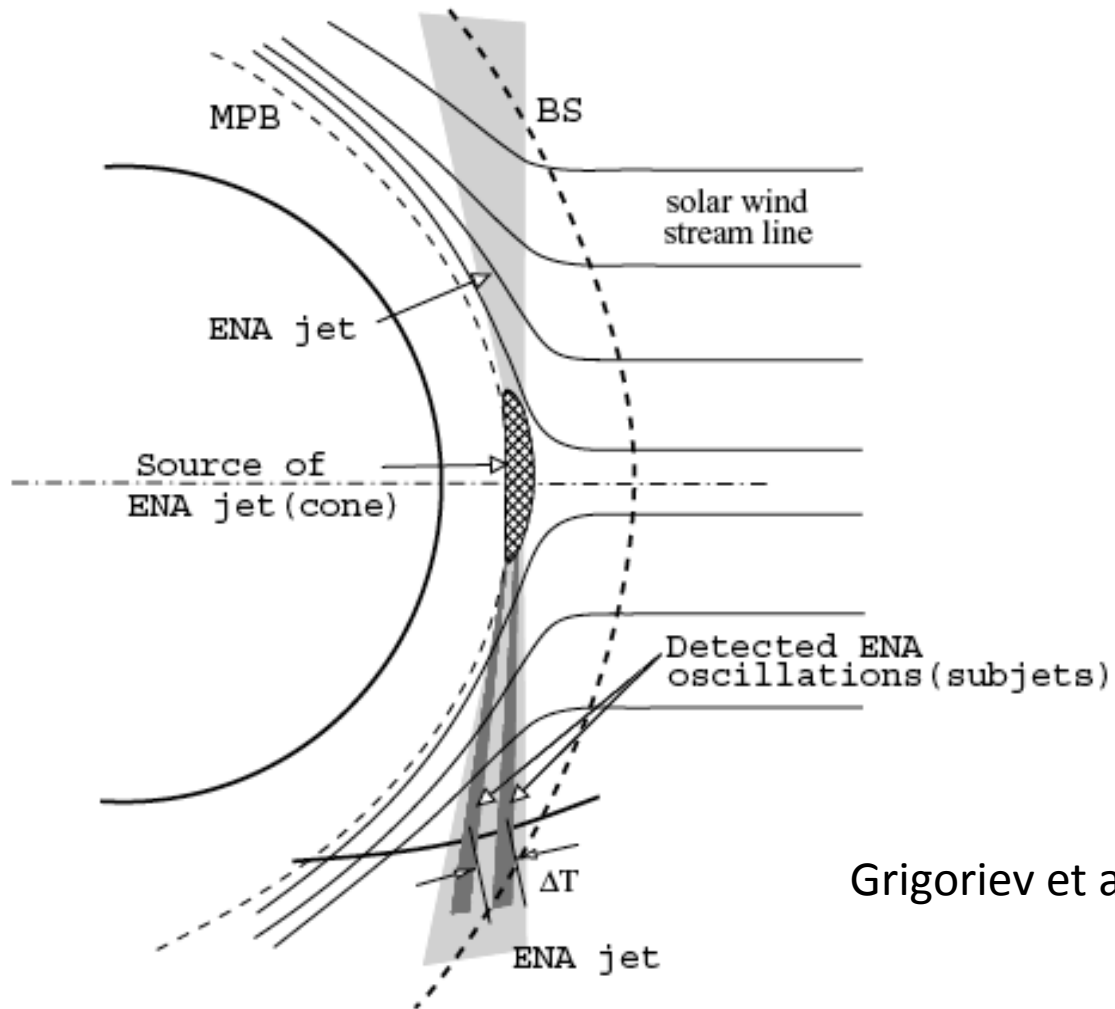
Fig. 5. Diagram of the auroral plasma acceleration above the magnetic anomalies at Mars. A cusp/cleft aurora is expected to occur between adjacent anomalies and a halo aurora to occur circumscribing the large-scale region of crustal magnetization.

SW backscattering from Phobos



Futaana et al., 2006

ENA emissions from Mars



Grigoriev et al., 2006

Getting old, but not too old...

Long time series: a full solar cycle and several Martian years

Comparisons with Venus Express

Collaboration with other Mars missions (MAVEN)



Old and useless?



New and better?