# Titan's Upper Atmosphere and Plasma Heating Effect

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From the Cassini Ion and Neutral Mass Spectrometer (INMS) measurements during numerous Titan flybys, some indications of asymmetric structure of Titan's upper atmosphere have been found. Besides the somewhat flattened configuration of the thermosphere as first reported by Mueller-Wordarg et al. (2008), it has also been shown by Cui et al. (2009) that the thermospheric temperature is higher (~153 K) on the Saturn-facing side than the value (~138 K) on the anti-Saturn side. Furthermore, the temperature (~ 155 K) on the ram-side is significantly larger than on the wake side (~ 137 K). Armed with this new information, we will explore the potential effect of atmospheric interaction with the corotating magnetospheric plasma and the energy injection via re-impact of the pickup exospheric ions. The energy budgets from different mechanisms will be compared.

References:

[1] Mueller-Wordarg, I.C.F., R.V. Yelle, J. Cui, J.H. Waite, Jr., J.Geophys. Res., 113, doi:10.1029/2007JE003033. E10005, 2008.
[2] Cui, J., R.V. Yelle, V. Vuitton et al., Icarus, 581-615, 2009.