

Comparison of topside ionospheric profilers for use in modelling and monitoring applications

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 - The NSSDC topside database
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- 3 Topside profile shape
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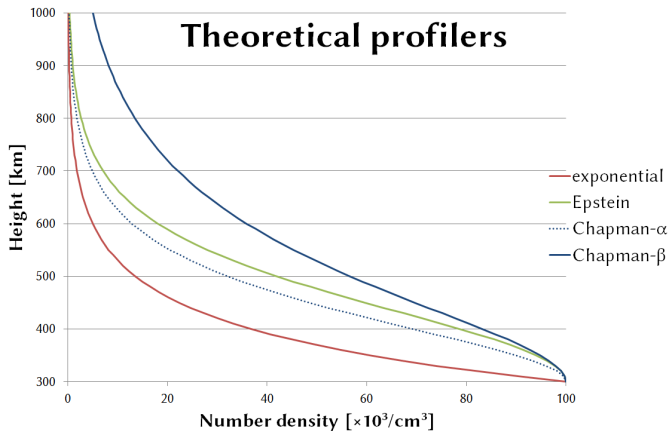
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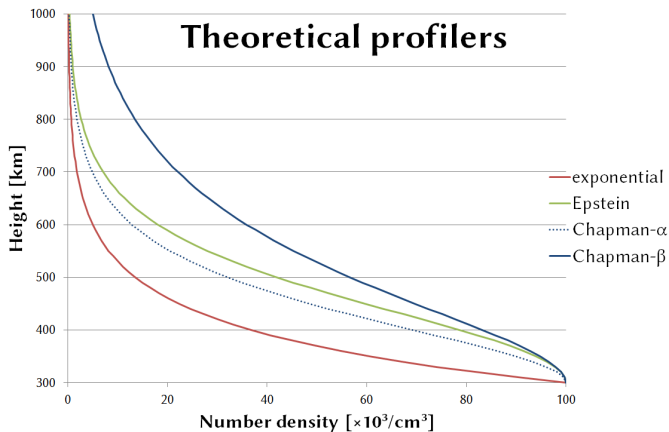
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- For the bottomside, up to F_2 -peak, digital ionosonde gives this profile; problem: the topside ionosphere can not be measured directly, so a model is needed.
- Different topside profilers are known from literature: Exponential, Epstein, Chapman- α and $-\beta$.

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Question:

Under what conditions should which profiler be used?

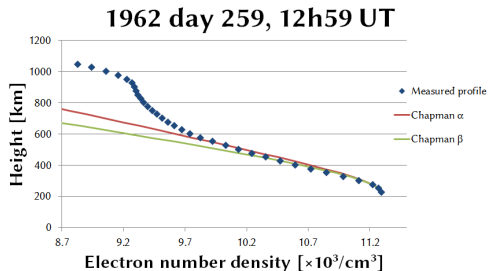
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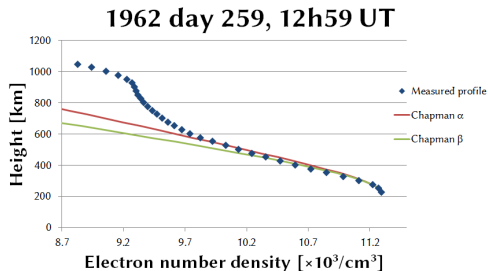
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- Only 32583 profiles were usable for our purposes.



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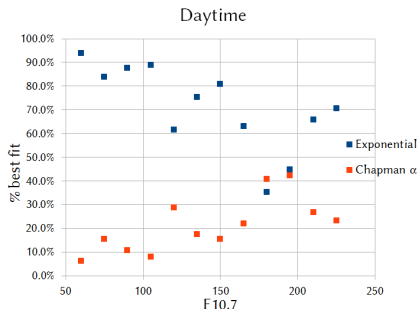
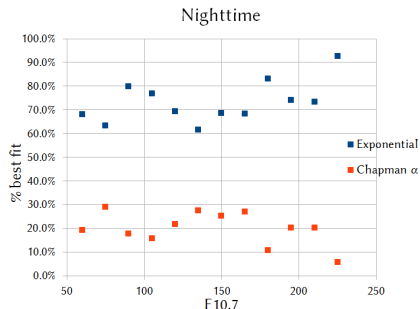
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- Due to the irregular coverage, artificial correlations between drivers can produce additional biases.

Influence of external drivers on profile shape

Despite problems with data coverage, the influences of F10.7, K_p , D_{st} , local time, season and magnetic coordinates on the best fitting profiler can be seen.

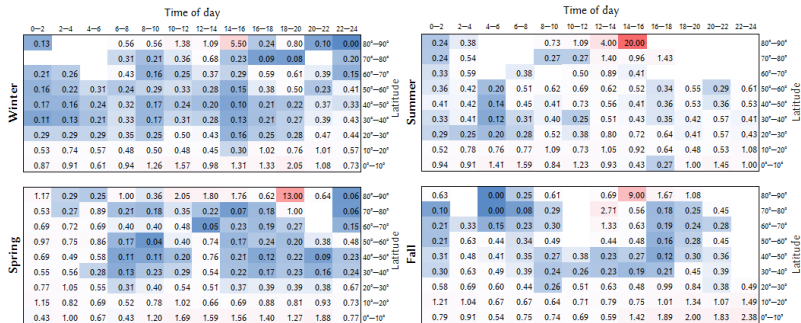
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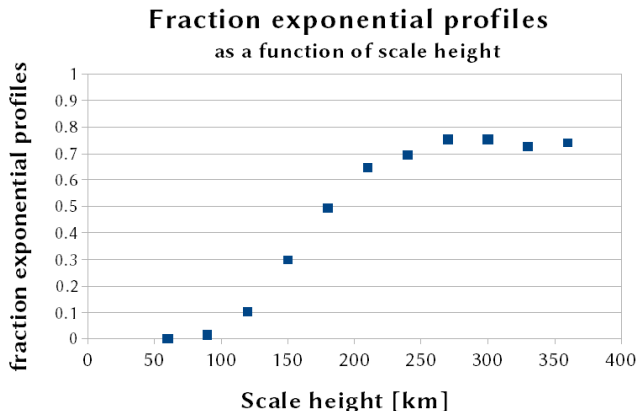
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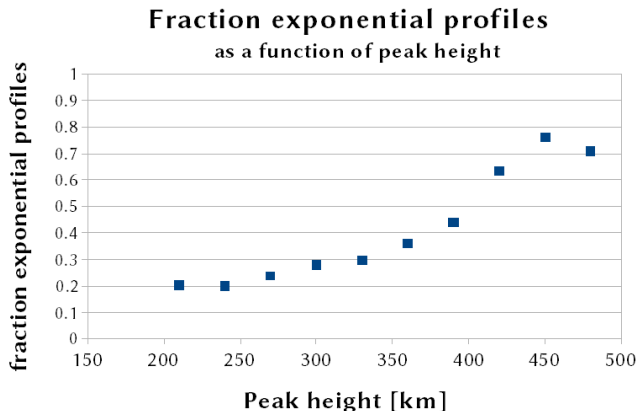
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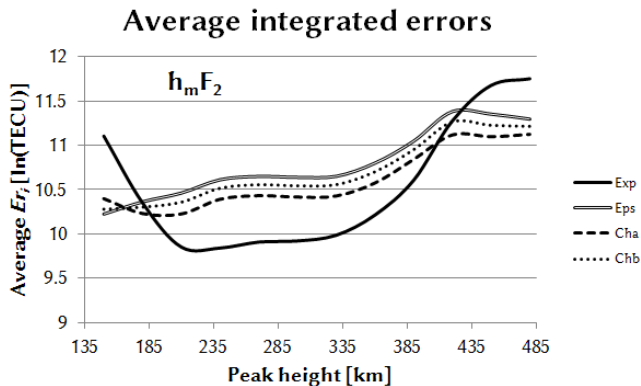
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- 2 The influence of external drivers (F10.7, magnetic activity, local time, etc.) on profile shape can be seen; however, is insufficient to choose best profiler.
- 3 Better choose profiler based on instantaneous and local characteristics of the ionosphere, such as $h_m F_2$ and $f_o F_2$.

- 1 T. Verhulst & S. Stankov, *The topside sounder database – Data screening and systematic biases*, Adv. Space Res. – in press (2013).
- 2 T. Verhulst & S. Stankov, *Evaluation of ionospheric profilers using topside sounding data*, submitted to J. Geophys. Res.-Space (2013).

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The end, thank you!