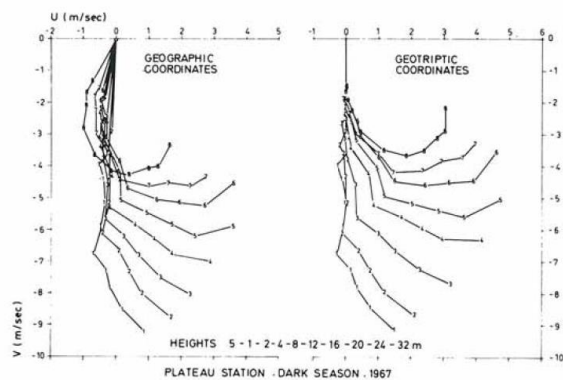


Probing the great Antarctic inversion – 50 years ago

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The temperature inversion that covers nearly all of the surface of the Antarctic continent is best developed over the East Antarctic Plateau. This area is characterized by high elevation (>3000 m), extremely flat terrain (<1 m / km), extremely dry air (saturation mixing ratio at -80°C is $0.5 \cdot 10^{-6}$), correspondingly low downward radiation (<100 W/m²), frequent diamond dust (317 days with blue sky precipitation) and long

periods without daily variation in temperature and energy fluxes. This favors the development of extreme surface inversions (up to 36 K over the 32 m tower at Plateau Station) and a balance of forces that has occasionally reduced the Ekman layer to less than 50 m thickness.

Plateau Station was operated from December 1965 to February 1968 at 40° E, 80° S. It has 4 months of continuous sunshine and 4 months of continuous darkness which lead to a coreless winter with minima below -86°C, while maxima rarely exceed -20°C, the annual mean being around -56°C. Situated at an elevation of 3625 m it has an annual mean pressure of 610 hPa which, together with low temperatures, aggravates living and working conditions.

The seminar presents the salient features of this unique meteorological setting and adds samples of the fantastic optical phenomena observed.

