

LOOKING TO ICE LAYERS FOR CLIMATE SECRETS

Two atmospheric phenomena, thought to foretell the progression of climate change, have been detected simultaneously by sensitive scientific instruments probing the night sky above Antarctica.

Polar mesospheric clouds (PMC) and polar mesosphere summer echoes (PMSE), caused by water vapour crystallising in the coldest region of the Earth's atmosphere – the mesosphere – 50 to 92 km up, were observed together for the first time by Australian Government Antarctic Division scientists at Davis station last summer.

The simultaneous observation, using a radar for PMSE and a lidar – light detection and ranging instrument – for PMC, is the first in the Southern Hemisphere and will allow scientists to compare differences between the phenomena in the southern and northern hemispheres and to better predict the effects of climate change.

'These phenomena have been well recorded and studied in the Northern Hemisphere but we've only recently detected them above Antarctica,' radar physicist, Dr Ray Morris, told delegates at the Scientific Committee on Antarctic Research Open Science Conference.

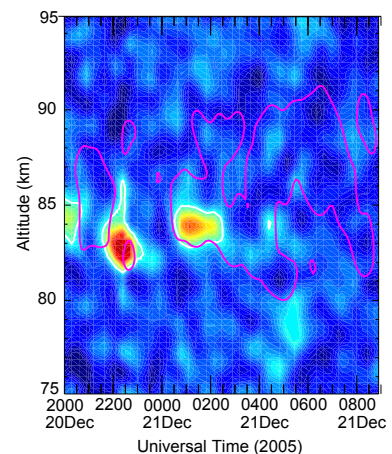
'In the 2005-2006 austral summer we identified PMC and PMSE at the same latitude as our northern counterparts – 68.6° south versus 69° north – using similar equipment, allowing us to compare the intensity and extent of these phenomena in each hemisphere.

'Our results show that the occurrence and brightness of Southern Hemisphere PMC and PMSE are lower than those reported in the Northern Hemisphere, and that the ice clouds peak about one kilometre higher in the Southern Hemisphere. Further observation is needed to explain these differences.'

These comparisons will help scientists understand the connections between mesosphere processes in the northern and southern hemispheres and provide a baseline against which changes in PMSE and PMC can be measured. This is important if we are to better understand and model climate change.

'The mesosphere is more sensitive to climate change than other parts of the atmosphere, and there is evidence to suggest that a warming of 1.9°C at the Earth's surface would result in a 20°C cooling in the mesosphere,' lidar physicist Dr Andrew Klekociuk said.

'If this happens, we could see changes in the extent, duration and intensity of PMSE and PMC, well before we see any effects in the lower atmosphere. So we may be able to use these phenomena to monitor climate change.'



A. KLEKOCIUK, R. MORRIS & J. INNIS

Polar mesosphere summer echoes (pink contour) were detected by radar 80-92 km above Davis station, at the same time as the lidar detected polar mesospheric clouds (colour).



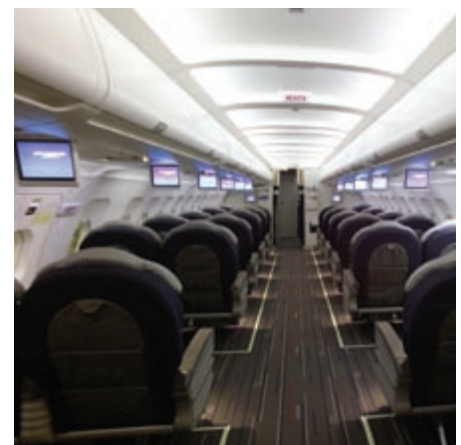
The A319.

New Airlink aircraft selected

Australia's new Antarctic Airlink aircraft is an Airbus A319. Minister for the Department of the Environment and Heritage, Senator Ian Campbell, said the new aircraft would increase Australia's access to Antarctica, improve logistical flexibility and create new opportunities, including new international collaborations.

The Airbus has a range of 6500 nautical miles and can fly from Hobart to Antarctica and return without refuelling. The aircraft's internal configuration can be arranged to accommodate different combinations of passengers and cargo. Initially, 19 passengers will be accommodated, but there is capacity for up to 40. Each passenger can take 50 kg of stowed luggage and 5 kg of carry on luggage. Demonstration flights of a jet aircraft are scheduled for this Antarctic summer at Wilkins Runway, 70 km southeast of Casey station. Regular continent to continent flights of the A319 will commence in 2007-08.

More information: www.aad.gov.au/airlink



The internal configuration of the spacious A319 can be arranged to accommodate different combinations of passengers and cargo.