



A 50,000-year climatic record from the new coastal TALDICE ice core: consequences on millennial-scale variability features through the Antarctic continent

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The TALDICE project retrieved a new ice core from a peripheral dome of East Antarctica. Talos Dome (72° 49' S, 159° 11' E; 2315 m; mean accumulation rate 80 kg m⁻² yr⁻¹; mean annual temp. -41°C) is located in the Northern Victoria Land, close to the Ross Sea. Back-trajectory analyses suggest that the site is mostly fed by air masses arriving both from the Pacific (and Ross Sea) and Indian Ocean sectors. The drilling team reached the depth of 1619.2 m in December 2007, covering more than 300,000 years of climatic records according to a preliminary age scale.

Up to 50,000 years before present, the ice core dating is based on the use of a glaciological model and an inverse method, constrained by numerous and reliable age markers. They are defined from the synchronization of CH₄ records of Talos Dome and Greenland ice cores, using in particular the rapid CH₄ changes associated with the last termination and the D/O events. Measurements of the CH₄ mixing ratio have been performed by LGGE and Bern laboratories using slightly different techniques, with a depth resolution ranging between 0.5 to 4 m.

The comparison of water isotopic profiles from Talos Dome, EDC, EDML (Antarctica) and North-GRIP (Greenland) ice cores, once put on a common time scale deduced from CH₄ and the optimisation from the inverse method, reveals that during the last deglaciation and the last glacial period, climatic changes at Talos Dome were essentially in phase with the Antarctic plateau, extending the bipolar seesaw sequence to this coastal site.

This comparison also highlights different climatic behaviors between sites situated in the Indo/Pacific sector and in the Atlantic sector of the Southern Ocean, the latter showing more abrupt swings toward relatively warm conditions of the Antarctic Isotope Maxima. We will discuss this feature with respect to the bipolar seesaw model of Stocker (2003) and with respect to other climatic proxies.