

Interactions between Atmosphere Dynamic, Continental Albedo and Ocean Circulation as driver of the millennial climate variability

L. Labeyrie

Institut Universitaire de France Université Versailles St-Quentin, Laboratoire des Sciences du Climat et de l'Environnement, Unité mixte CNRS-CEA Domaine du CNRS, av. de la Terrasse F-91198 Gif/Yvette, France; (labeyrie@lsce.cnrs-gif.fr)

The globality of the rapid climate changes first studied by W. Dansgaard and H. Oeschger in the Greenland ice cores has produced a fantastic environment to study the mechanisms which drives Earth Climate on centennial to millennial scale. Following P.D. Jones, S. Johnsen and J. Mitchell, I am the first paleoceanographer awarded of the Hans Oeschger medal. My talk will thus focus on my understanding of the role of the ocean in millennial variability. The subject is not easy, and knowledge is still limited by the small number of sediment cores studied at sufficiently high resolution (better than 100 years) and well dated. Another problem derives from the low number of proxies. We begin to get some constraints on the changes in deep-water hydrology, and renewal rate, which may serve as base for the construction of integrated concepts. The dominating idea is that most of the action, seen from the ocean, derives from a modulation of the North Atlantic Meridional Overturning driven by the changes in density gradient between Northern Atlantic and Southern Ocean (themselves due to lowered salinity events in the North: the Heinrich events, or in the Southern ocean). But the role of the low latitudes, the atmosphere dynamics and wind driven circulation as a driver of climate and its Meridional Overturning Circulation component has been generally underevaluated, apart from some lonely wolves. I will present my own personal perspective on the recently published results and their consequences.