

Visual stratigraphy (VS) of ice cores with a line scanner

The visual stratigraphy is one of the most basic information one can obtain from an ice core. In the ice visible are bands with more clear ice and with cloudy ice. The regularity and disturbance of ice is recognizable.

High-resolution VS profiles can be obtained since the development of digital scanners, computers and large storage media. The used line scanner was designed at the Alfred Wegener Institut (AWI), Bremerhaven , and later modified at the Niels Bohr Institute, Copenhagen.

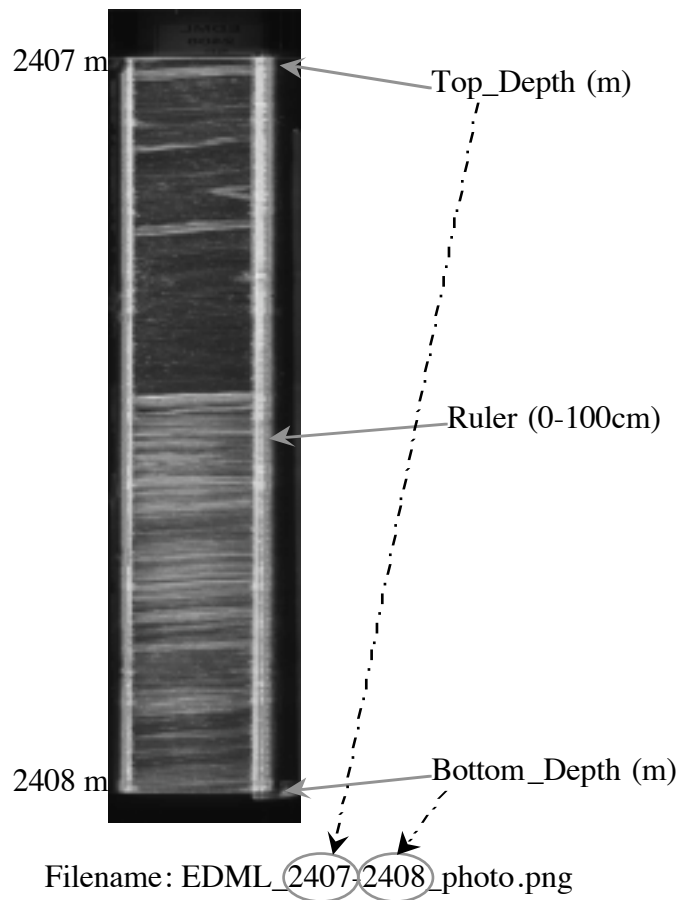
The measurement is comparable to that of dark field microscopy: An indirect light source and a line scanner camera are mounted below and above the ice core section in the way that they move synchronously along the ice. The camera records the light that is scattered. Originally it measured light intensities in 8-bit resolution due to a failure of the most significant bit of the camera the effective dynamical range is 7 bit. By adjusting the light source diaphragm aperture according to the brightness of visible layers the profile is not seriously disturbed. The line scanner is designed to scan ice cores with a maximum length of about 170 cm und width of about 10 cm. The resolution is 115 pixels per cm.

Clear ice appears as black and visible layers or air bubbles appears white. Before you can start measuring the ice has to be microtomed on both sides because the sawing of the ice makes the surface to uneven for scanning.

Linescanning was part of the EDML ice processing at the AWI in Bremerhaven in summer 2002 (113- 450 m), summer 2003 (450 – 1563 m) and summer 2004 (1563 – 2564 m).



Some information about the VS images of the EDML ice core:



For further information please contact Sepp Kipfstuhl (kipfstuhl@awi-bremerhaven.de) or Anja Lambrecht (alambrecht@awi-bremerhaven.de).