



## **Fabric and textural evolution within the EPICA ice cores: EDC and EDML**

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The European Project for Ice Coring in Antarctica (EPICA) has drilled two cores: Dome Concordia (EDC) and Dronning Maud Land, Kohnen Station (EDML). UCL has obtained samples of these cores in order to carry out mechanical experiments, following on from work carried out on other deep cores (e.g. GRIP). We have measured crystal size (texture) and orientation (fabrics) throughout the two cores in order to increase understanding of the deformation processes occurring at both of the two sites. EDC crystal size for the entirety of the core (EPICA Community, 2004) and fabrics of the upper 1500 m (Wang *et al.* 2002) have previously been measured. Our crystal size measurements and fabrics were found to agree with these previous data.

EDC fabrics were found to progressively develop a single maximum that is first seen at 1288 m: a strong single maximum is first recorded at 1838 m. Polygonisation and migratory recrystallisation are observed throughout the EDC core, with their occurrence increasing with depth. The Schmid factor, which is used as a measure of the softness of deformation, is found to decrease with depth. It is also confirmed that the principal strain applied to the EDC region is uniaxial compression. Tertiary creep is observed by 1800 m depth.

EDML fabrics in comparison produced unusual structures exhibiting cross-girdle fabrics for samples taken from mid-depths of the core and a single maximum being observed at a depth of 2271 m. Such unusual fabrics are explained by the presence of bi-axial extension superimposed on uniaxial compression.

Our results confirm the expected uniaxial compression at EDC but suggest biaxial extension superimposed on uniaxial compression at EDML. There are outstanding questions regarding deformation processes at EDML and recrystallisation processes at EDC. Both sites provide good reason for further study of the deformation processes.