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The INTIMATE event stratigraphy of the last glacial period

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The North Atlantic INTIMATE (INtegration of Ice-core, MArine and TErrestrial records) group has previously recommended an Event Stratigraphy approach for the synchronisation of records of the Last Termination using the Greenland ice core records as the regional stratotypes.

A key element of these protocols has been the formal definition of numbered Greenland Stadials (GS) and Greenland Interstadials (GI) within the past glacial period as the Greenland expressions of the characteristic Dansgaard-Oeschger events that represent cold and warm phases of the North Atlantic region, respectively. Using a recent synchronization of the NGRIP, GRIP, and GISP2 ice cores that allows the parallel analysis of all three records on a common time scale, we here present an extension of the GS/GI stratigraphic template to the entire glacial period. In addition to the well-known sequence of Dansgaard-Oeschger events that were first defined and numbered in the ice core records more than two decades ago, a number of short-lived climatic oscillations have been identified in the three synchronized records. Some of these events have been observed in other studies, but we here propose a consistent scheme for discriminating and naming all the significant climatic events of the last glacial period that are represented in the Greenland ice cores.

In addition to presenting the updated event stratigraphy, we make a series of recommendations on how to refer to these periods in a way that promotes unambiguous comparison and correlation between different proxy records, providing a more secure basis for investigating the dynamics and fundamental causes of these climatic perturbations.

The work presented is a part of a newly published paper in an INTIMATE special issue of Quaternary Science Reviews: Rasmussen et al., ‘A stratigraphic framework for abrupt climatic changes during the Last Glacial period based on three synchronized Greenland ice-core records: refining and extending the INTIMATE event stratigraphy’, Quaternary Science Reviews, vol. 106, p. 14-24, 2014.