

High-resolution chemostratigraphic calibration of the Campanian-Maastrichtian boundary interval at Krons Moor (northern Germany): a Boreal reference section revisited

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The Saturn quarry near Krons Moor (northern Germany) exposes a continuous fossiliferous succession of upper Campanian to lower Maastrichtian chalks (Krons Moor and lowermost Hem Moor formations). It has been suggested as a reference section for the base of the Maastrichtian Stage in the Boreal Realm (NIEBUHR et al., 2011), the GSSP being situated in the Tethyan Realm at Tercis les Bains in SW France (ODIN & LAMAURELLE, 2001). In the original definition of the GSSP, the base of the Maastrichtian was established on an arithmetic mean of 12 biohorizons at the 115.2-m-level at Tercis. However, carbon stable isotope data were originally not included and $\delta^{13}\text{C}$ curves for Tercis were later published independently by THIBAULT et al. (2012) and VOIGT et al. (2012). Low-resolution carbon stable isotope curves for Krons Moor were presented by VOIGT et al. (2010) and NIEBUHR et al. (2011), the latter interpolating the GSSP level mainly by means of macrofossil data to the lower part of the *Belemnella obtusa* Zone, ca. 10–12 m higher than the formerly accepted level at flint layer F600 (base of the *B. lanceolata* Zone).

In a recent reappraisal of the Krons Moor section in the course of a palaeoecological study, high-resolution geochemical data including carbon and oxygen stable isotopes have been obtained from the uppermost Campanian to lower Maastrichtian (45 m, sample spacing 0.25 m). The resulting very detailed $\delta^{13}\text{C}$ curve allows a precise calibration of the GSSP level at Krons Moor and a high-resolution correlation to the stratotype section (Tercis) as well as to other important Campanian–Maastrichtian boundary sections (Norfolk, Stevns-1 core, Contessa). All sections are characterized by a cyclic decrease in $\delta^{13}\text{C}$ of ca. 1‰ V-PDB during the latest Campanian to earliest Maastrichtian (lower part of the CMBE sensu VOIGT et al., 2010). The base of the Maastrichtian is located slightly below the earliest Maastrichtian isotope minimum (eMIM) and corresponds to a horizon in the lowermost part of the *B. obtusa* Zone, 12.5 m above F600 at Krons Moor and close to the level formerly identified by (commonly rare) ammonite occurrences (NIEBUHR et al., 2011). Thus, the FAD of *B. obtusa* provides a useful proxy datum for the base of the Maastrichtian in the Boreal Realm. During the early Maastrichtian, $\delta^{13}\text{C}$ values remained low in Krons Moor, fluctuating between 1.2 and 1.8‰ V-PDB, and are characterized by a conspicuous cyclic pattern.

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