32. Interhemispheric time scale for the Hauterivian and its implications for the carbon cycle in the Berriasian-Barremian times

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Discrepancies in the ages and durations of the Berriasian to Barremian stages still exist between geological data and the proposed geological time scale of 2016 (OGG *et al.*, 2016; LENA *et al.*, 2018). The Hauterivian Stage suffers from these discrepancies, as its duration is proposed at 3.92 myr (OGG *et al.*, 2016), while astrochronology in the Tethysian area (SE France and SE Spain) led to a duration of 5.9 ± 0.4 myr (MARTINEZ *et al.*, 2015). In order to reconcile these durations, we investigated the Agrio Formation in the Neuquén Basin (Argentina). A total of 2,200 samples were collected every 0.25 cm and measured for magnetic susceptibility with a Kappabridge KLY-2. From spectral analyses carried out on these MS signals, it appears that the 100-kyr eccentricity is continuously recorded throughout the Agrio Formation, allowing duration calculations. In addition, a new U-Pb age measured on zircons was derived in the upper part of the Agrio Formation using the CA-ID-TIMS method. Thus, four U-Pb ages are now available in the Agrio Formation measured with the U-Pb CA-ID-TIMS (AGUIRRE-URRETA *et al.*, 2015, 2017). Notably, the astrochronological durations fit with three of the U-Pb ages. A fourth age appears 300 kyr older than what is suggested by astrochronology, which may be due to protracted crystallization of zircons in the magmatic chamber. These new data in the Agrio Formation, together with correlations to the Tethysian area, suggest a revision to the duration of the Hauterivian Stage of 5.22 ± 0.11 myr starting at 131.29 ± 0.25 Ma and ending at 126.07 ± 0.25 Ma. The previous overestimate of the duration of the Hauterivian Stage was likely due to distortion of the 405-kyr eccentricity in the sedimentary record, as recent studies document (LAURIN *et al.*, 2017; MARTINEZ, 2018). Thanks to these revised ages and previous astrochronological frameworks, we were able to revise the ages and durations of stages from the late Berriasian to the Barremian-Aptian boundary. A synthesis of $\delta^{13}C$ measured on belemnites (MARTINEZ & DERA, 2015) indicate a clear 2.4-myr cycle in the carbon cycle record which fits with the main paleoceanographic events. Higher amplitudes of this cycle are notably observed during major volcanic episodes,

suggesting that acceleration of the hydrolic cycle lead to a reinforcement of the long-MILANKOVITCH cycles.

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33. Early Cretaceous neritic carbonate community and facies response to paleonvironmental and sea-level changes: New evidences from the Apennine carbonate platform of southern Italy

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The early Cretaceous marine sedimentary record is punctuated by several crises of carbonate production and perturbations of the global carbon cycle (WEISSERT & ERBA, 2004; FÖLLMI & GODET, 2013). The earliest of these crises occurred during the Valanginian period. In the northern Tethysian domain, this crisis entailed the demise of carbonate platforms and major changes in carbonate producer communities. High trophic conditions are mirrored by the shift to a heterozoan neritic community that started close to the Berriasian/Valanginian boundary and persisted up to the early Barremian. Fossil assemblages, combined with lithofacies characteristics, are here used to reconstruct the Valanginian-Barremian paleoenvironmental history of the San Lorenzello section, which belongs to the Apennine Carbonate Platform (APC) of southern Italy. Unlike coeval northern Tethysian carbonate platforms, this platform did not record any drowning event during the Valanginian-Barremian. However, it responded to paleoenvironmental perturbations by biofacies changes that are here investigated.