Late Cretaceous–early Eocene magneto-biostratigraphy and rock-magnetism from the Belluno Basin (NE Italy).

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The magnetostratigraphy and the rock-magnetism of the upper Cretaceous – lower Eocene Tethyan marine Ardo and Cicogna composite section (Belluno Basin, NE Italy) are presented. The paleomagnetic results have been integrated with calcareous nannofossil biostratigraphy, indicating that the composite section extends from Chron C29r to Chron C23r, encompassing nannofossil Zones *Micula prinsii* – NP12 (Maastrichtian–Ypresian). We determined the sediment accumulation rates by means of correlation with the CK95 geomagnetic polarity time scale; they vary from ~3 m/Myr in the Danian part of the section, up to ~18 m/Myr stratigraphically upward. As indicated by the rock-magnetic data, the magnetic mineralogy of the sediments generally consists of variable proportions of magnetite–maghemite–hematite, which are iron oxides characterized by different oxidation states and structures. We placed the rock-magnetic variability on a temporal reference frame using the CK95-based age-depth function. Data indicate that relatively warmer climate periods (i.e. the Paleocene-Eocene thermal maximum and the early Eocene warming trend leading to the Early Eocene climatic optimum) are associated with high relative content of detrital hematite with respect to magnetite-maghemite, while relatively cooler climates (i.e. the Paleocene) are associated with a relative increase of magnetite-maghemite. We speculate that the relative increase of detrital hematite observed during global warming periods is associated with intensified chemical weathering conditions. This scenario is supported by the fact that hematite is one of the most abundant iron oxide phase produced on land during the chemical weathering of Fe-bearing silicates under warm and humid climates. Our hypothesis is confirmed by a correlation between rock-magnetic properties and global climate as revealed by a standard benthic oxygen isotopes record from the literature. This approach confirms the existence during the latest Cretaceous–early Eocene interval of the silicate weathering negative feedback mechanism to eventually stabilize long-term Earth's surface temperature.