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Magnetic characterization of the late Paleocene-early Eocene Cicogna section (NE Italy): climate forcing on sedimentation ()

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During the late Paleocene-early Eocene (~60 Ma to 50 Ma), Earth's climate experienced a warming trend that culminated with the Early Eocene Climatic Optimum (EECO). The EECO was characterized by warm conditions at even extreme high latitudes, subdued latitudinal temperature gradients, and virtually nonexistent polar ice sheets. The early Paleogene long-term climate was punctuated by several short-lived hyperthermal events, the most prominent of which is the Paleocene Eocene Thermal Maximum (PETM). Both marine and continental PETM records registered an increase in climate humidity also at high latitudes and a sensible increase in seasonal precipitation. Here we present rock-magnetic data of the magneto-biostratigraphically calibrated Cicogna section from the Belluno Basin (Venetian Southern Alps, NE Italy); the Cicogna section extends from Chron C25r to Chron C23r spanning the NP7/NP8-NP12 nannofossil Zones, with a

relatively constant sediment accumulation rate of˜18 m/Myr. Rock-magnetic data correlated with the reference δ18O record from the literature reveal an enrichment of detrital hematite relative to maghemite-magnetite across the PETM as well as from ~54 Ma up the EECO (~52 Ma). This enrichment is interpreted as due to enhanced continental weathering conductive to hematite formation during PETM and early Paleocene warm and humid climates. The observed correlation between magnetic mineralogy and global climate is in agreement with the negative feedback mechanism for the long-term stabilization of the Earth's surfaces temperature by the weathering of silicates as proposed by previous authors.

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