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Magnetostratigraphy of the Lower Jurassic (Hettangian-Sinemurian)

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Magnetostratigraphy and correlation to the Geomagnetic Polarity Time Scale (GPTS) constitute a standard dating tool in Earth Sciences. When integrated with biostratigraphy and especially cyclostratigraphy, magnetostratigraphy allows high-resolution correlations all over the world, because paleomagnetic polarity reversals can geologically be seen as globally synchronous events. It is therefore the stratigraphic tool of choice to perform correlations between continental and marine realms. An integrated astronomical time scale, which has been achieved for most of the Neogene and is in progress for the Palaeogene and Mesozoic, provides high resolution and accuracy. The Geologic Time Scale (GTS) for the Early Jurassic is far less robust (Gradstein et al., 2004, 2012) because magnetostratigraphic records of marine Hettangian and Sinemurian successions are rare and equivocal (Gallet et al., 1990; Yang et al., 1996). Consequently, the Global Stratotype Section and Points (GSSP's) for the Hettangian (Kuhjoch; Austria) and Sinemurian (East Quantoxhead; UK) are mainly defined on biostratigraphic (ammonite) arguments (Hillebrandt et al., 2007; Bloos and Page, 2002).
Cyclostratigraphic analyses from the Lower Jurassic marine successions at St. Audrie's Bay and East Quantoxhead located on the west Somerset coast on the southern side of the Bristol Channel Basin (UK) resulted in an independent astronomical framework for the Hettangian Stage, allowing to locate the stratigraphic position of the marine de[U+FB01]ned Triassic–Jurassic and Hettangian–Sinemurian boundary in the continental realm (Ruhl et al., 2010). We will present the magnetostratigraphy of the Hettangian and lower Sinemurian successions of St. Audrie's Bay and East Quantoxhead, which will be used to evaluate the marine-continental correlations in the recovery interval following the end-Triassic mass extinction and to develop a more robust GPTS for the Lower Jurassic.