# Age model and geochemical evolution of FeMn crusts

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Hydrogenetic ferromanganese (FeMn) crusts form condensed stratigraphic records of seawater evolution over millions of years that can be traced by combining various isotopic systems (e.g. Nd, Hf, Pb) and trace element compositions. Correlating measured chemical changes to geologic or oceanographic events require a precise and accurate age model for the crusts. To date, Be and Os isotope systems, in combination with the Co chronometer models, remain the most largely employed methods for age and growth rate estimates. Here, we present a high-resolution absolute age model and combined lithochemostratigraphy for a 14 cm thick FeMn crust recovered from Tropic Seamount, north east Atlantic. Our investigation is part of the NERC funded MarineE-Tech project and the core was acquired during cruise JC142 (2016) using an ROV-mounted drill. Here, we report an accurate age model for the deposit's micro-stratigraphy extending as far back as the Middle Eocene using combined LA-ICP-MS U-Pb dating, Os isotopes and Co-chronometry from 130 micro-drilled subsamples. Geochemical profiles highlight the strong variability of enrichment of critical metals (Co, Te, Pt) throughout the core, notably impacted by phosphatisation, hiatuses and diagenetic remobilisation. This research demonstrates the importance of a multidisciplinary approach to cross-validate age models and its importance for exploration of FeMn crusts with regard to understandings factors that influence the temporal variability of metal-grade.