

Initial MagnetoSusceptibility Event and Cyclostratigraphy Analysis of the Proposed Basal Guadalupian Boundary

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High-resolution chronocorrelation can be achieved for marine rocks by combining magnetic susceptibility measurements with robust biostratigraphic control. The method has been named MagnetoSusceptibility Event and Cyclostratigraphy (MSEC). For marine sediments magnetic susceptibility (MS) is a measure of the concentration of magnetic grains. In succession, the resultant signal is dominated by changes in detrital input that result largely from fluctuations in climate and eustasy. In analyses to date, MSEC trends with increasing MS magnitudes correlate well with episodes of regression, whereas trends with decreasing MS magnitudes correspond with transgressive episodes. Sections located near paleodeltas will produce elevated MS values compared with more distal sections in a basin, but variations (trends) resulting from erosional events will correspond (i.e., MS magnitudes may vary, but the patterns will correlate). Regional versus global events can be differentiated by comparing sections that comprise a global MSEC network, in which an individual section might exhibit an unmatched excursion (regional) in addition to those shared within the network (global). Advantages of MSEC analysis include: 1) high-resolution data sets (sampling at 5 to 10 cm intervals—often providing higher resolution than the associated biostratigraphy upon which it is dependent for initial temporal control; 2) an ability to be measured and interpreted in the field; and 3) results that have been demonstrated to be facies independent. The latter may be particularly significant for correlation between the Cisuralian and Guadalupian type regions. This presentation will focus on methodology and initial results from the basal Guadalupian boundary across its type region.