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On the evolution of high-frequency ingredients of the secular variation and of their expression at core surface, as inferred from observatory data and main field models

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The analysis of the first time derivative, with the residual external contribution removed, of H, Z, and D for 24 observatories world-wide with 100-150 years long time series, shows the presence in data of a so-called ∼80-year variation. The geographical distribution and its temporal evolution as revealed by 400 years time span of the gufm1 field model is derived and discussed. Time-longitude, time-latitude plots and spectral analysis have been used to derive quantitative information on the ∼80-year variation features. The analysis has been extended to the radial component of the geomagnetic field at the core surface. The results indicate that the ∼80-year variation entirely accounts for the field with time-averaged axisymmetric component subtracted and high-pass-filtered with cutoff period 400 years of Finlay and Jackson (2003).