A new empirical model for Free Core Nutation

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It is well known that the current IAU2000 nutation theory needs to be complemented with a model providing the Free Core Nutation (FCN), since otherwise the residuals observation-theory would be noticeably larger, thus damaging the predictions accuracy. FCN exhibits complex patterns of variation affecting its amplitude, period and phase, whose geophysical causes are not fully understood yet. Therefore, it has been customary using empirical models to describe the inferred FCN signal and predict it to a limited extent.

In this contribution we report on the progress of the derivation of a new empirical model of FCN based on the analysis of VLBI observations performed with the GFZ version of the VieVS package. The method can be seen as an extension of the recent work on FCN by Krasna el al (2014). Results have been compared to that model and Lambert's, which is the one recommended in the IERS Conventions 2010. The level of agreement is satisfactory but our new model give rise to a noticeable lower wrms of residuals along the whole period of VLBI observations according to our computations. Further tests and comparisons with other models are intended.