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Spurious draconitic harmonic errors in GPS analyses

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Time series of parameter estimates from GPS analyses (including Earth orientation parameters, geocentre estimates and coordinate time series) contain spurious periodic signals at harmonics of the GPS draconitic year. These harmonic signals are expressions of error in the GPS analyses and the causes of these errors are not fully understood. It has been demonstrated that mis-modelling sub-daily loading signals (for example atmospheric tidal loading deformation), high multipath as well as failing to resolve ambiguities to integer values can influence the expression of these spurious signals. The dominant source of the error however remains unknown, and the residual periodic error limits the ability of GPS to detect surface deformations at the mm level. In this poster we describe the problem and investigate several possible causes pertaining to orbit modelling of the GPS constellation.