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On the effect of code multipath mitigation in GPS-based time and frequency transfer

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GPS-based time and frequency transfer is presently performed either with a code-only analysis (as done for TAI, using C/A or P codes), or with a combined analysis of code and carrier phase measurements using geodetic analysis techniques (as used for the generation of the IGS time scale). When neglecting calibration issues, the accuracy of both solutions highly depends on the noise of the GPS codes. An important part of this code noise is caused by multipath. However, when using a linear combination of GPS codes and carrier phases, we are able to characterize the behaviour of multipath in a specific station. Using this information to mitigate the effect of multipath on the code measurements, we evaluate the influence of the code noise reduction on the time transfer results. On one hand, we investigate a possible reduction of the rms of the code-only CGGTTS results. On the other hand we evaluate the influence of the multipath mitigation on the results obtained from the combined code and carrier phase time transfer.