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Research Article

GPS Carrier-Phase Time Transfer Using Difference Integer Ambiguity Resolution

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Abstract

GPS is widely used for time and frequency transfer. To estimate a single baseline solution can be performed using external products (constellation ephemeris and station coordinates). The baseline is estimated using code and phase ionosphere-free measurements. The phase measurements are used to estimate the ionosphere-free parameters. Such solutions give very good results when modelled with a single solution (e.g., GPS orbits) and the baseline solution. However, the solution is sensitive to discrepancies in the models, and is only observed through the noise. Here, we propose to solve the integer ambiguity resolution problem. The advantage is the complete elimination of the clock drifts observed in the baseline solution. This allows also a reliable continuous connection between overlapping baselines (the ambiguity can be completely eliminated). Several time transfer results are analyzed and have been extended to a network of stations using integer ambiguity resolution. The corresponding results are given for a few European stations.

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