

## IMPROVED GNSS RECEIVER USING VELOCITY INTEGRATION

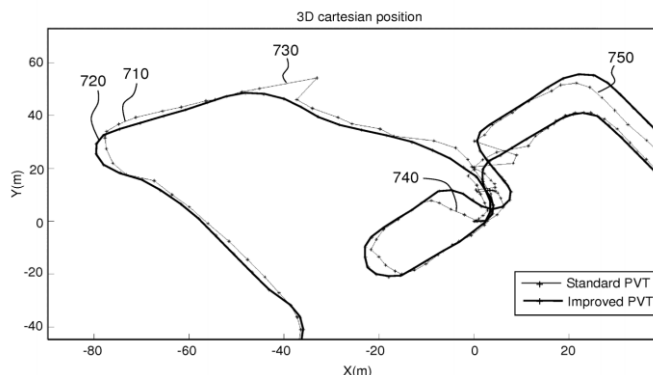
### Technological advantages

#### Innovative :

- Reduces transient failures
- Compatible with consumer type GNSS (smartphones, cars, ...)
- No required hardware modifications

#### Efficient :

- Accuracy improvement
- Improved usage in tough environments
- No complex software algorithms



Comparison for a 3D trajectory using corrections  
from the invention and using a regular tracking

### Invention synthesis

The invention deals with GNSS receivers positioning accuracy especially in tough conditions.

GNSS receivers may have degraded performances depending on the topological configuration, effects from multi-reflections (such as in urban canyons), atmospheric perturbations, satellites variations (orbit, internal clock). The positioning tracking and its accuracy may be degraded and even lost. Complex solutions (hardware, software) allows to correct and improve the positioning.

The invention is based on using data from the signal carrier (modulated with a pseudo-code and a pseudo-range) to rebuild the position, velocity and time (PVT). Using the velocity vector (time integration), and with a comparison with the positioning data, a correction may be applied using weighted averages. The software is simple and no hardware changes are required.

### Commercial benefits

- Economical system, no modification on existing hardware, suited to consumer type receivers, improvement in accuracy and resilient to transient failures.

### Potential applications

- All GNSS positioning systems, especially consumer type receivers.

*Patented invention - under license.*