GNSS ANTENNA ADD-ON
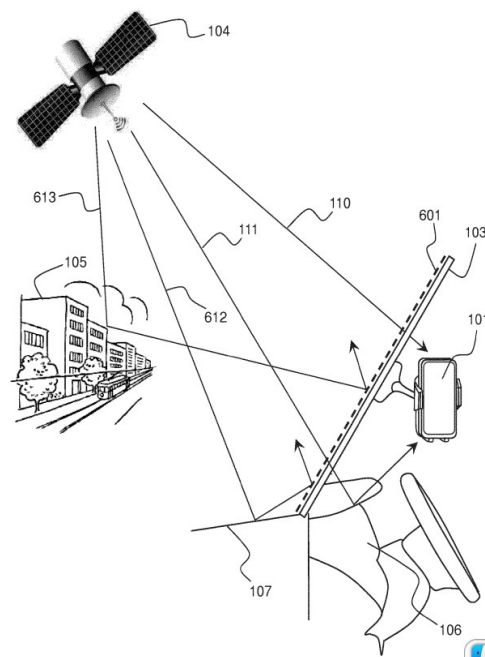
Technological advantages

- **Compatible with all types of GNSS receivers**
- **No change required (software, hardware) to existing devices**
- **Easy to set-up**

Invention synthesis

The invention presents an add-on for a GNSS receiver antenna to reduce the effects of multi-paths reflections.

For the satellite positioning, pseudo-range are computed from (at least) 4 satellites signals (positioning and PRN code) so to estimate position, velocity, time (PVT). For a good accuracy, satellites must be in direct line of sight (LOS) without reflections (from building, light poles, road, any surface) because they introduce delays, power reductions and phase offsets. Depending on delays (in the PRN sens), removing multi-path signals becomes complex (flat fading).

GNSS signals have a right hand circular polarization (RHCP), multi-path signals undergo polarization changes. The invention presents a filtering device (reducing power), in the GNSS frequency bands, based on polarization as to reject left hand circular polarization (LHCP). The filtering material (made of periodic structures) can be located before the receiver antenna. Depending on the application, it can be optically transparent (placed on a glass surface), on a metalized textile (in a smartphone, its casing).

Schematic description showing the LHCP rejection

(104) Satellite
(110,111) GNSS in direct view (RHCP)
(105,107) Reflecting elements
(612,613) Reflected signals
(103) Vehicle wind shield
(601) Reflective polarizing material (optically transparent)
(101) GNSS receiver

Commercial benefits

- Improvement in the satellite positioning accuracy especially rough environments.
- Reduced costs to design and set-up.
- No modification in existing systems.
- Compatible with public GNSS use.

Patented invention - under license.

Potential applications

- Well suited to public GNSS use such as car navigation, smartphone location especially in urban areas and mountainous environments.

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