Claims

1 – Method for authenticating the position X(t) of a mobile element (1), a mobile element comprising at least a GNSS receiver, ~~k~~r, having a function of estimating the position X(t) of that mobile element (1), this method being characterized in that it comprises, in combination, at least the following steps:

- determining one or more items of data (21) associated with the position X of ~~a~~ the GNSS receiver, r,
- extracting reference data associated with the position X(t) of the said mobile element (1) from a map or road map cartographic database (23),
- determining at least one consistency indicator (22) Ic(X) using the first item of data associated with the said receiver r and the reference data coming from the cartographic database,
- filtering the said indicator or indicators Ic(X), in order to improve the detection rate or the false alarm rate,
- authenticating (24) the position X(t) of the said mobile element (1) using the result obtained by application of an authenticity decision function to one or more of the said consistency indicators Ic(X).

2 – Method according to Claim 1, characterized in that the filtering step is a temporal integration of the indicator over a given period of time.

3 – Method according to Claim 1, characterized in that the establishment of the cartographic database (23) and the calculation of the consistency indicator are carried out in a centralized device connected by a communications network to the said mobile elements (1).

4 – Method according to Claim 1, characterized in that the establishment of the cartographic database (23) and the calculation of the consistency indicator are carried out within the said mobile elements (1).

5 – Method according to one of Claims 1 to 4, characterized in that in order to authenticate the position X(t) of a mobile element (1), the consistency indicator Ic(X) is calculated from the position of pseudolites indicated in the cartographic database.

6 – Method according to one of Claims 1 to 4, characterized in that in order to authenticate the position X(t) of a mobile element (1), the consistency indicator Ic(X) is calculated from the direction or directions θ_{map1}, θ_{map2} of ~~the~~ a road segment travelled and/or the speed V_{map} estimated over this segment, from data indicated in the cartographic database.

7 – Method according to one of Claims 1 to 4, characterized in that in order to authenticate the position X(t) of a mobile element(1), the consistency indicator Ic(X) is calculated from, on the one hand, the distance travelled $D_r(t)$, estimated by the measured speed $V_r(t)$, and on the other hand the distance as the bird flies D_{map}, or the curvilinear distance on ~~the~~ a road graph in the cartographic database.

8 – Method according to one of Claims 1 to 4, characterized in that in order to authenticate the position X(t) of a mobile element (1), the consistency indicator Ic(X) is calculated from the measured altitude z_r, compared with that z_{map} indicated in the cartographic database (23).