CLAIMS

1. A method of locating a transmitting source in a multipath environment, the method comprising:

obtaining, by each receiver K of a plurality of spatially separated receivers, a sequence of samples of a signal transmitted by the transmitting source and received by the receiver, each sample respectively associated with a time of obtaining said sample, wherein one or more receivers M among the plurality of receivers K each obtain a respective sequence of samples over a plurality of different positions along a respective trajectory r(t) with respect to the site associated with the respective receiver M; and

processing the obtained sequences of samples to identify the most likely location of the transmitting source,

wherein said processing includes:

obtaining data indicative of an area of interest divided into a grid of potential locations of the transmitting source;

modifying the sequences of samples to generate, for each receiver and for each potential location in the grid, data indicative of an estimated sequence of samples likely to be received by the receiver over a plurality of times, the modifying based on a distance and a direction from the receiver to the potential location and a corresponding line of sight propagation of a signal transmitted from the potential location;

generating, for each given potential location in the grid, a matrix corresponding to the given potential location and associating each receiver with the estimated sequence of samples generated for the receiver for the corresponding location in the grid; and

comparing the matrices corresponding to different potential locations to identify the matrix corresponding to potential location with the highest likelihood of real location of the transmitting source.

2. The method of Claim 2, wherein the estimated sequence of samples Vkt(q) generated for a k-th receiver for a potential location q is calculated as:

$Vkt(q)=zk(t-Dk(q))\exp(-j\theta q)$, where $\theta q = 2\pi\, rk(t)T * uk(q)/\lambda$

where k ranges over 1...N (N being the number of sites), zk(t) is the sequence of samples obtained by the k-th receiver, uk(q)is a unit vector from the k-th receiver site to q, and Dk(q) is the propagation time from q to the k-th receiver site.

3. The method of Claim 1, wherein comparing the matrices corresponding to different potential locations comprises calculating the norm of each matrix, wherein the potential location q corresponding to the matrix having the highest norm is identified as the potential location with the highest likelihood of real location of the transmitting source.

4. The method of Claim 1, wherein at least one receiver M obtains a respective sequence of samples over a plurality of different positions along a trajectory using a moving antenna.

5. A system for locating a transmitting source in a multipath environment, comprising:

a plurality of spatially separated receivers K, each receiver K configured to obtain a sequence of samples of a signal transmitted by the transmitting source and received by the receiver, each sample respectively associated with a time of obtaining said sample, wherein one or more receivers M among the plurality of receivers K are each configured to obtain a respective sequence of samples over a plurality of different positions along a respective trajectory r(t) with respect to the site associated with the respective receiver M; and

a processor and memory module operatively connected to the plurality of spatially separated receivers K and configured to process the sequences of samples obtained by the plurality of spatially separated receivers K to identify the most likely location of the transmitting source,

wherein the processor and memory module is configured to:

obtain data indicative of an area of interest divided into a grid of potential locations of the transmitting source;

modify the sequences of samples to generate, for each receiver and for each potential location in the grid, data indicative of an estimated sequence of samples likely to be received by the receiver over a plurality of times, the modifying based on a distance and a direction from the receiver to the potential location and a corresponding line of sight propagation of a signal transmitted from the potential location;

generate, for each given potential location in the grid, a matrix corresponding to the given potential location and associating each receiver with the estimated sequence of samples generated for the receiver for the corresponding location in the grid; and

compare the matrices corresponding to different potential locations to identify the matrix corresponding to potential location with the highest likelihood of real location of the transmitting source.

6. The system of Claim 5, wherein the estimated sequence of samples Vkt(q) generated for a k-th receiver for a potential location q is calculated as:

$Vkt(q)=zk(t-Dk(q))\exp(-j\theta q)$, where $\theta q = 2\pi\, rk(t)T * uk(q)/\lambda$

where k ranges over 1...N (N being the number of sites), zk(t) is the sequence of samples obtained by the k-th receiver, uk(q)is a unit vector from the k-th receiver site to q, and Dk(q) is the propagation time from q to the k-th receiver site.

7. The system of Claim 5, wherein the processor and memory module is configured to compare the matrices corresponding to different potential locations by calculating the norm of each matrix, wherein the potential location q corresponding to the matrix having the highest norm is identified as the potential location with the highest likelihood of real location of the transmitting source.

8. The system of Claim 5, wherein at least one receiver M is configured to obtain a respective sequence of samples over a plurality of different positions along a trajectory using a moving antenna.

9. A computer program product comprising a program of instructions readable by a computer, the program of instructions for executing a method of locating a transmitting source in a multipath environment, the method comprising:

obtaining, by each receiver K of a plurality of spatially separated receivers, a sequence of samples of a signal transmitted by the transmitting source and received by the receiver, each sample respectively associated with a time of obtaining said sample, wherein one or more receivers M among the plurality of receivers K each obtain a respective sequence of samples

over a plurality of different receiving positions along a respective trajectory r(t) with respect to the site associated with the respective receiver M; and

processing the obtained sequences of samples to identify the most likely location of the transmitting source,

wherein said processing includes:

obtaining data indicative of an area of interest divided into a grid of potential locations of the transmitting source;

modifying the sequences of samples to generate, for each receiver and for each potential location in the grid, data indicative of an estimated sequence of samples likely to be received by the receiver over a plurality of times, the modifying based on a distance and a direction from the receiver to the potential location and a corresponding line of sight propagation of a signal transmitted from the potential location;

generating, for each given potential location in the grid, a matrix corresponding to the given potential location and associating each receiver with the estimated sequence of samples generated for the receiver for the corresponding location in the grid; and

comparing the matrices corresponding to different potential locations to identify the matrix corresponding to potential location with the highest likelihood of real location of the transmitting source.

10. The method of Claim 1, wherein obtaining by the at least one receiver M the sequence of samples over the plurality of different receiving positions along the trajectory comprises physical repositioning of the at least one receiver M.

11. The system of Claim 5, wherein the at least one receiver M is configured to obtain the sequence of samples over the plurality of different receiving positions along the trajectory by physical repositioning.