Claims

1. A method for loss concealment of spatial audio parameters, the spatial audio parameters comprise at least a direction of arrival information, the method comprising the following steps:

receiving a first set of spatial audio parameters comprising at least a first direction of arrival information;

receiving a second set of spatial audio parameters, comprising at least a second direction of arrival information;

replacing the second direction of arrival information of a second set by a replacement direction of arrival information derived from the first direction of arrival information, if at least the second direction of arrival information or a portion of the second direction of arrival information is lost or damaged;

wherein the step of replacing comprises dithering by injecting random noise to the first direction of arrival information to obtain the replacement direction of arrival information; and

wherein the step of injecting is performed, if the first or second diffuseness information indicates a high diffuseness; and/or if the first or second diffuseness information is above a predetermined threshold for the diffuseness information.

2. Method according to claim 1, wherein the first and second sets of spatial audio parameters comprise a first and a second diffuseness information, respectively.

3. Method according to claim 2, wherein the first or the second diffuseness information is derived from at least one energy ratio related to at least one direction of arrival information.

4. Method according to claim 2 or 3, wherein the method further comprises replacing the second diffuseness information of a second set by a replacement diffuseness information derived from the first diffuseness information.

5. The method according to one of the previous claims, wherein the replacement direction of arrival information complies with the first direction of arrival information.

6. The method according to one of the claims 1 to 5, wherein the diffuseness information comprises or is based on a ratio between directional and non-directional components of an audio scene described by the first and/or the second set of spatial audio parameters.

7. The method according to one of the claims 1 to 6, wherein the random noise to be injected is dependent on the first and/or second diffuseness information; and/or

wherein the random noise to be injected is scaled by a factor depending on the first and/or second diffuseness information.

8. The method according to one of the claims 1 to 7, further comprising the step of analyzing the tonality of an audio scene described by the first and/or second set of spatial audio parameters or of analyzing the tonality of a transmitted downmix belonging to the first and/or second set of spatial audio parameters to obtain a tonality value describing the tonality; and

wherein the random noise to be injected is dependent on the tonality value.

9. The method according to claim 8, wherein the random noise is scaled down by a factor decreasing together with the inverse of the tonality value or if the tonality increases.

10. The method according to one of the previous claims, wherein the method comprises the step of extrapolating the first direction of arrival information to obtain the replacement direction of arrival information.

11. The method according to claim 10, wherein the extrapolating is based on one or more additional direction of arrival information belonging to one or more sets of spatial audio parameters.

12. The method according to one of claims 10 or 11, wherein the extrapolation is performed, if the first and/or second diffuseness information indicates a low

diffuseness; or if the first and/or second diffuseness information are below a predetermined threshold for diffuseness information.

13. The method according to one of the previous claims, wherein the first set of spatial audio parameters belong to a first point in time and/or to a first frame and wherein the second set of spatial audio parameters belong to a second point in time and/or to a second frame; or

wherein the first set of spatial audio parameters belong to a first point in time and wherein the second point in time is subsequent to the first point in time or wherein the second frame is subsequent to the first frame.

14. The method according to one of the previous claims, wherein the first set of spatial audio parameters comprise a first subset of spatial audio parameters for a first frequency band and a second subset of spatial audio parameters for a second frequency band; and/or

wherein the second set of spatial audio parameters comprise another first subset of spatial audio parameters for the first frequency band and another second subset of spatial audio parameters for the second frequency band.

15. A method for decoding a DirAC encoded audio scene, comprising the following steps:

decoding the DirAC encoded audio scene comprising a downmix, a first set of spatial audio parameters and a second set of spatial audio parameters;

performing the method for loss concealment according to one of the previous claims.

16. Computer readable digital storage medium having stored thereon a computer program having a program code for performing, when running on a computer a method according to one of the previous claims.

17. Loss concealment apparatus for loss concealment of spatial audio parameters, the spatial audio parameters comprise at least a direction of arrival information, the apparatus comprises:

a receiver for receiving a first set of spatial audio parameters comprising a first direction of arrival information and for receiving a second set of spatial audio parameters comprising a second direction of arrival information;

a processor for replacing the second direction of arrival information of the second set by a replacement direction of arrival information derived from the first direction of arrival information if at least the second direction of arrival information or a portion of the second direction of arrival information is lost or damaged;

wherein replacing by the processor comprises the processor dithering by injecting random noise to the first direction of arrival information to obtain the replacement direction of arrival information; and

wherein injecting is performed by the processor, if the first or second diffuseness information indicates a high diffuseness; and/or if the first or second diffuseness information is above a predetermined threshold for the diffuseness information.

18. A decoder for a DirAC encoded audio scene comprising the loss concealment apparatus according to claim 17.