CLAIMS:

1. A computer implemented method of determining coherency between composite images having phase and amplitude components, the method comprising:

providing first and second amplitude images indicative of amplitude values of pixels of a respective first and second composite images;

generating, for said first and second amplitude images, respective first and second restored images indicative of a pseudo phase images thereof, said generating comprising applying to each of said first and second amplitude images a first directional derivative operator and a second directional derivative operator thereby generating for each of said amplitude images respective first directional derivative image and second directional derivative image thereof, and estimating said first and second pseudo phase images of the first and second restored images by computing an angle between the respective first and second directional derivative components at each pixel of said first and second amplitude images; and

generating a coherency map based at least on the first and second restored images associated with said first and second amplitude images by determining a cross-correlation between said first and second restored images, said first coherency map being indicative of decorrelation between said first and second composite images.

2. The method of claim 1, comprising:

providing at least one additional amplitude image indicative of amplitude values of pixels of at least one additional composite image, applying said first directional derivative operator and said second directional derivative operator to said at least one additional amplitude image thereby generating respective additional first directional derivative image and additional second directional derivative image thereof; and

generating at least one additional coherency map based at least on said additional first directional derivative image and said additional second directional derivative image of said at least one additional amplitude image and at least one of the directional derivative images of the first amplitude image or of the second amplitude image, said at least one additional coherency map being indicative of decorrelation between said at least one additional composite image and said first or second composite images.

3. The method of claim 2, comprising generating a coherency change detection map from the first and the at least one additional coherency map, said coherency change detection map being indicative of decorrelation between said first, second, and third, composite images and configured to substantially cancel out areas exhibiting continuous decorrelation in all of the composite images.

4. The method of claim 1, comprising applying a plurality of pairs of the first directional derivative operator and the second directional derivative operator to the amplitude image of at least one of the composite images, each of said pair of directional derivative operators being applied in different image directions, and generating a coherency map based on said plurality of pairs of the first directional derivative operator and the second directional derivative operator.

5. The method of claim 4, wherein the image directions of each pair of the directional derivative operators are orthogonal.

6. The method of claim 1, wherein the directions of the directional derivative operators are orthogonal.

7. The method of claim 6, wherein the directions of the derivative operators are on horizontal and vertical axes of their respective amplitude images.

8. The method of claim 1, wherein generation of at least one of the coherency maps comprises computing complex cross-correlation.

9. The method of claim 1, comprising spatially registering the amplitude components of the composite images with respect to one another.

10. The method of claim 1, wherein the composite images are coherent SAR or coherent SAS images.

11. The method of claim 3, comprising processing and analyzing the coherency change detection map to identify regions and/or objects of interest therein.

12. A system for determining decorrelation between two or more composite images, each of said composite images having an amplitude component and a phase component, the system comprises one or more processors and memory and is configured for

providing first and second amplitude images indicative of amplitude values of pixels of respective first and second composite images and processing said first and second amplitude images to determine decorrelation between said first and second composite images; said processing comprises:

generating, for said first and second amplitude image, respective first and second restored images indicative of a pseudo phase images and respective one of first and second amplitude images, said generating comprises applying to each of said first and second amplitude images a first directional derivative operator and a second directional derivative operator, thereby generating for each of said amplitude images respective first directional derivative image and second directional derivative image thereof, and estimating said first and second pseudo phase images of the first and second restored images by computing an angle between the respective first and second directional derivatives components at each pixel of said first and second amplitude images; and generating a coherency map based at least on the first and second restored images associated with said first and second amplitude images by determining a cross-correlation between said first and second restored images, said coherency map being indicative of decorrelation between said first and second composite images.

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13. The system of claim 12, wherein said one or more processor is further configured for processing data on first, second and third amplitude images, said processing further comprising estimating first, second and third pseudo phase images, thus generating at least first, second and third restored images for respective three amplitude images of three different composite images, and generating two coherency maps based on said first, second and third restored images, each coherency map being indicative of coherency between a different pair of said three different composite images based at least on their respective estimated phase images.

14. The system of claim 13, comprising at least one change detector configured and operable to generate a coherency change detection map based on the data generated by the two coherence data generators, said coherency change detection map being indicative of changes between at least two of the three different composite images, and substantially cancels out areas exhibiting high decorrelation in all of the composite images.

15. The system of claim 12, wherein said one or more processors comprises at least one phase estimator, said phase estimator comprising first directional differentiator and second directional differentiator configured and operable to generate respective first directional derivative image and second directional derivative image of an amplitude image.

16. The system of claim 15, wherein said one or more processors comprises a composite image restorer associated with said at least one phase estimator, said composite image restorer configured and operable to generate a restored composite image from the first directional derivative image and the second directional derivative image and the respective amplitude image.

17. The system of claim 16, wherein said one or more processors comprises at least one coherence data generator configured and operable to determine the coherency based on the restored composite images generated for each amplitude image.

18. The system of claim 12, wherein said one or more processors comprises at least one coherence data generator configured and operable to compute cross-correlation between the two or more composite images based at least on their estimated phase images.