CLAIMS:

1. A computer implemented method of determining coherency between composite images having phase and amplitude components, ~~wherein the coherency is determined based on the amplitude components of the images,~~ 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 ~~first~~ coherency map based at least on the ~~directional derivative~~first and second restored images associated with~~of~~ 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 generating for each amplitude image a restored composite image from its respective directional derivative images and amplitude image, and generating the coherency map from said restored composite image.~~

~~**3.** The method of claim 1 comprising estimating from the directional derivative images of each amplitude image a phase image and generating the coherency map from the estimated phase image and its respective amplitude image.~~

~~4.~~2. The method of ~~any one of~~ claim~~s~~ 1~~, to 3~~ 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.

~~5.~~3. The method of claim 2~~4~~, 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.

~~6.~~4. The method of ~~any one of the preceding~~ claim~~s~~ 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.

~~7.~~5. The method of claim 4~~6~~, wherein the image directions of each pair of the directional derivative operators are orthogonal.

~~8.~~6. The method of ~~any one of claims~~ claim 1 ~~to 5~~, wherein the directions of the directional derivative operators are orthogonal.

~~9.~~7. The method of claim ~~8~~6, wherein the directions of the derivative operators are on horizontal and vertical axes of their respective amplitude images.

~~10.~~8. The method of ~~any one of the preceding~~ claim~~s~~ 1, wherein generation of at least one of the coherency maps comprises computing complex cross-correlation.

~~11.~~**9.** The method of ~~any one of the preceding~~ claim~~s~~ 1, comprising spatially registering the amplitude components of the composite images with respect to one another.

~~12.~~**10.** The method of ~~any one of the preceding~~ claim~~s~~ 1, wherein the composite images are coherent SAR or coherent SAS images.

~~13.~~**11.** The method of ~~any one of~~ claim~~s~~ 3~~5 to 12~~, comprising processing and analyzing the coherency change detection map to identify regions and/or objects of interest therein.

~~14.~~**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~~wherein said decorrelation is determined based on the amplitude components of the images ,the system comprising~~:

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.~~at least two phase estimating units, each configured and operable to generate an estimated phase image based on at least two different directional derivatives of an amplitude image of one of said two or more composite images; and~~

~~at least one coherence unit configured and operable to generate coherence data indicative of coherency between said two or more composite images, based at least on the estimated phase images of the amplitude images, said coherence data being indicative of decorrelation between said two or more composite images~~.

~~15.~~13. The system of claim 12~~4~~, 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~~comprising three of the phase estimating units for generating three estimated phase images for respective three amplitude images of three different composite images, and two of the coherence units, each configured and operable to generate data indicative of coherency between a different pair of said three different composite images based at least on their respective estimated phase images~~.

~~16.~~14. The system of claim 13~~5~~, comprising at least one change detector~~ion unit~~ configured and operable to generate a coherency change detection map based on the data generated by the two coherence data generators~~units~~, 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.

~~17.~~15. The system of ~~any one of~~ claim~~s~~ 12~~4 to 16~~, wherein ~~each phase estimation unit~~said one or more processors comprises at least one phase estimator, said phase estimator comprising first directional differentiator~~ing unit~~ and second directional differentiator~~ing unit~~ configured and operable to generate respective first directional derivative image and second directional derivative image of an amplitude image.

~~18.~~16. The system of claim 15~~7~~, wherein said one or more processors comprises~~ing~~ a composite image restorer~~ing unit~~ associated with said at least one~~each~~ phase estimator~~ion unit~~, said composite image restorer~~ing unit~~ 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.

~~19.~~17. The system of claim 1~~6~~8~~,~~ wherein ~~the~~ said one or more processors comprises at least one coherence data generator~~unit is~~ configured and operable to determine the coherency based on the restored composite images generated for each amplitude image.

~~20.~~18. The system of ~~any one of~~ claim~~s~~ 12~~4 to 19~~, wherein ~~the~~said one or more processors comprises at least one coherence data generator~~unit is~~ configured and operable to compute cross-correlation between the two or more composite images based at least on their estimated phase images.

~~**21.** A phase image estimator comprising at least two directional derivative units, each configured and operable to receive an amplitude image of a composite image and generate a different directional derivative image thereof, and a processing utility configured and operable to estimate a phase image of said composite image based on said directional derivative images.~~

~~**22.** The estimator of claim 21 wherein the directional derivative units are implemented as modules of the processing utility.~~

~~**23.** The estimator of claim 21 or 22 wherein the directional derivative units are configured and operable to compute different directional derivatives associated with different spatial image plane directions of the amplitude image.~~

~~**24.** The estimator of claim 23 wherein the image plane directions are orthogonal.~~