CLAIMS

1. A method of providing image data for constructing an image of a region of a three dimensional target object, comprising:

providing, from a radiation source, incident radiation directed at a target object;

detecting an intensity of radiation scattered by the target object;

determining image data for each of a respective plurality of slices within the target object each indicating one or more characteristics of the target object at a respective depth within the target object, wherein the image data is determined based on the detected intensity of radiation via an iterative process wherein running estimates of the image data for each of the plurality of slices are updated step by step with each iteration.

2. The method of claim 1, wherein the image data for each slice is determined based upon an integral of a property of the object between first and second surfaces.

3. The method of claim 2, wherein the property of the object is one of: an optical potential or an atomic potential of the object.

4. The method of any preceding claim, comprising determining a running estimate of a transmission function for each slice indicating at least one characteristic of the target object.

5. The method of claim 4 when dependent upon claim 2 or 3, wherein the transmission function is based upon the integral of the property of the object between the surfaces.

6. The method of claim 4 or 5, wherein an accuracy of the running estimates of the transmission functions is improved by re-estimating the transmission functions with each step.

via an iterative process wherein running estimates of the image data for each of the plurality of slices are updated step by step with each iteration.

28. The apparatus of claim 27, wherein the processor is arranged to perform the method of any of claims 2 to 26.

29. Computer software comprising computer-executable instructions which, when executed by a processing device, causes the processing device to perform the method of any of claims 1 to 26.

30. The computer software of claim 29, wherein the computer-executable instructions are stored on a computer-readable medium.