



(12) **United States Patent**
Skoglund et al.

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(54) **APPARATUS AND METHOD FOR PROVIDING HIGH FIDELITY RECONSTRUCTION OF AN OBSERVED SAMPLE**

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(57) **ABSTRACT**

The invention relates to a method and an apparatus for providing high fidelity reconstruction built on a grid of an observed sample. An input means (10, 11, 13, 14; 40, 43, 14; 52, 13, 14) provides observed data of the sample. An estimated distribution means (19; 44; 54) provides an initial estimated distribution of the sample. A prejudice distribution means (21, 25, 15; 45, 15; 54, 15) provides a blurred prior prejudice distribution using estimated data. A calculating means (12) calculates in an iterative process for each iteration: a new estimated distribution of the sample using comparison between the estimated distribution in the next preceding iteration and said observed data of the sample from said in-put means; a new prior prejudice distribution on the new estimate less blurred than the prior prejudice distribution in the next preceding iteration. The calculation means (12) continues the iterations until the difference between the new estimated distribution and the next preceding estimated distribution is less than a predetermined condition. The calculated result is presented.

22 Claims, 6 Drawing Sheets

