substrate responsive to said unique sets of compensation values so that all of the features having a common size in at least one region are written using the same compensation values from the associated set.

In one aspect of the present invention, there is provided a method comprising: dividing a multi-dimensional pattern of discrete features of different sizes to be written to a substrate into a plurality of contiguous regions; assigning a unique set of compensation values to each region; and using a write beam of a write system to write the features to the substrate responsive to said unique sets of compensation values so that all of the features having a common size in at least one region are written using the same compensation values from the associated unique set.

In another aspect of the present invention, there is provided an apparatus comprising: a memory which stores a set of encoded data which provides a unique set of compensation values for each of a plurality of different contiguous regions of a multi-dimensional pattern of discrete features to be written to a substrate; and a write beam which writes the features of the multi-dimensional pattern to the substrate responsive to said set of encoded data in the memory, wherein at least identical regions are written to the substrate using the same portion of the encoded data set.

These and various other features and advantages of various embodiments can be understood from the following detailed description and a review of the associated drawings.

Brief Description of the Drawings

FIG. 1 shows a data storage medium formatted in accordance with various embodiments of the present invention.

FIG. 2 provides an exemplary format for a data track of the storage medium.

FIG. 3 is an exemplary format for a servo field.

FIG. 4 is an exemplary format for a data sector.

FIG. 5 sets forth a functional block diagram for a writing system used to write patterns to a storage medium in accordance with various embodiments.

FIG. 6 shows a first exemplary pattern of features in a two dimensional (2D) array.

FIG. 7A shows a simplified pattern of repeating patterns.

FIG. 7B illustrates how different power levels may be used to write the pattern of FIG. 7A

FIG. 7C shows the use of different duty cycles to write the pattern of FIG. 7A.

FIG. 7D provides X and Y dimension deflection compensation values that can be used to write the pattern of FIG. 7A.

FIG. 8 shows a second exemplary pattern of features in a 2D array.

FIG. 9 provides a flow chart for a DATA WRITE routine useful in writing the pattern of features in FIG. 8.

FIG. 10 shows a third exemplary pattern of features in a 2D array.

FIG. 11 provides a flow chart for a DATA WRITE routine useful in writing the pattern of features in FIG. 10.