MEASURING METHOD, APPARATUS AND SUBSTRATE

ABSTRACT

A pattern (310, 610) is formed on a substrate (W) using a lithographic step (400). The pattern includes first and second sub-patterns (312, 316; 612, 616) positioned adjacent one another on the substrate and having respective first and second periodicities. The pattern is observed (402) to obtain a combined signal (403) which includes a beat component having a third periodicity at a frequency lower than that of the first and second periodicities. A measurement of performance of the lithographic process is determined (406) by reference to a phase of the beat component (405). Depending how the sub-patterns are formed, the performance parameter might be critical dimension (CD) or overlay, for example. For CD measurement, one of the sub-patterns may comprise marks each having of a portion sub-divided by product-like features. The measurement can be made using an existing alignment sensor of a lithographic apparatus. Sensitivity and accuracy of the measurement can be adjusted by selection of the first and second periodicities, and hence the third periodicity.

Fig. 5b