

**LITHOGRAPHIC APPARATUS AND METHOD FOR DETERMINING Z POSITION  
ERRORS/VARIATIONS AND SUBSTRATE TABLE FLATNESS**

**5 ABSTRACT**

A lithographic projection apparatus including: an illumination system configured to provide a beam of radiation; a support configured to support a patterning device, the patterning device configured to impart the beam with a pattern in its cross section; a substrate table (WT) configured to hold a substrate (W); a projection system configured to project the patterned radiation onto a target portion of the substrate (W); a plurality of level sensors (LS) for sensing a level of a substrate carried on the substrate table (WT) at a plurality of different positions, and a system for determining the position of the substrate table (WT). Also provided is a controller that is configured to cause relative movement between the substrate (W) and the level sensor array from a first position at which a first measurement is taken to a plurality of overlapping positions at which further measurements are taken, and a calculator for calculating a measure of Z position errors and/or substrate table (WT) unflatness and/or a measure of the level sensor (LS) position/offset using the plurality of overlapping measurements.

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Figure 2