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A. Grabowski

Position sensing in nanopositioning devices

SECTION HEADING

Where nanopositioning technology and motion control systems of the highest accuracy level are concerned, the company Physik Instrumente (PI) has been a leading supplier worldwide for many years. One of the reasons for the success of PI on the market is the know-how to measure positions in the nm- and sub-nm range and to choose the right sensor for different applications.

In this talk an overview is given of two different types of sensor systems used at PI and in PI products is given.

For devices with short travel ranges (up to 1mm) usually capacitive sensors are used. In this part of the talk an introduction in capacitive position sensing with one and two electrode sensor systems is presented and their applications, performance data and technical limits are shown.

For systems with larger travel ranges (>1mm) usually optical incremental sensor systems are used. During the last few years different manufacturers have developed optical incremental sensors with a resolution down to 62.5pm, which is already much better than most commercially available interferometers. Here a short overview is given on the optical encoder products used in PI products.

Finally the advantages/disadvantages of the different sensor systems are compared and an outlook is given on the future of position sensing in nanopositioning devices.

References:

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