

## Determination of geometric errors of revolute kinematic pairs using LaserTracer system

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**Keywords:** LaserTracer, kinematic errors, revolute joint

Laser tracking systems are often being used for checking machines due to their high accuracy combined with short measurement time. Because of their versatility, they can be successfully used to identify kinematic errors for devices of different design, sizes, and applications such as large-size Coordinate Measuring Machines or machining centers. Currently, the machines use both linear and rotary joints in their kinematic structure. While testing the linear joints with laser is a well-known problem, checking rotary pairs is a more demanding task because the direct result of measurements performed using laser interferometers is given as a distance. That is why indirect methods, such as multilateration or other numerical methods, need to be applied in order to obtain the values of evaluated parameters [1]. This article presents a method for identifying selected errors of rotary pairs using a laser tracking system – LaserTracer, which is one of the most sophisticated and accurate laser tracking devices [2]. Authors describe the tested mechanism, the methodology used during errors identification and experimental results.



**Fig. 1.**  
LaserTracer system used for determination of geometric errors of revolute kinematic pairs

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- [2] Sładek, J., Gaska, A., Olszewska, M., Kupiec, R., Krawczyk, M., Virtual coordinate measuring machine built using LaserTracer system and spherical standard, *Metrology and Measurement Systems*, 20 (1) 2013, pp. 77-86.