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## ABSTRACTS

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### CONTACTLESS PROTECTIVE DEVICES FOR DEPLOYMENT IN AUTOMATED WORKPLACES

(pages 1-4)

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**Keywords:** light curtains, automation, human protection

**Abstract:** Safety in automated workplaces is the most important feature of any machine, equipment and system as a whole in a modern and advanced society, where some part of it performs mechanical movement. The task is a set of comprehensive measures to prevent contact / collision of the device (robot, conveyor etc.) during this movement with any part of human operator. In addition, behaviour of modern automated workplaces is not always predictable, since movement (performed inside the automated cell) are usually controlled by a control program whose structure is only known to the manufacturer's programmer. These reasons pointed to the advanced functions use that is available in such equipment as light curtains.

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### EXPERIMENTAL VERIFICATION OF OBJECT LEVITATION BY OPTICAL SENSOR

(pages 5-10)

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**Keywords:** magnetic levitation; optical sensor; laser module; motion detection

**Abstract:** Magnetic levitation used in technical applications such as transport systems in particular high-speed trains requires position control of the levitation system. It is precisely by suitable position control that there are no hazardous situations of contact of the mechanical parts outside the magnetic cushion, which can cause a dangerous state at very high speeds. However, for correct regulation, it is necessary to first turn out a reliable position sensing subsystem. It is precisely sensing the position using the optical method that this work is devoted to. The method of shielding is verified, when a

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smaller collimated beam falls on the photodiode. In order to measure the changes as accurately as possible, a laser collimating beam of light was chosen as the source.

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## **ADAPTABLE MOBILE ROBOT FOR ROUGH TERRAIN**

(pages 11-15)

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**Keywords:** mechatronics, education, mobile robot, embedded systems

**Abstract:** The paper deals with didactic model of mobile four wheeled robot which is able to adapt to rough terrain. The geometry of undercarriage can be changed in accordance with rough terrain. Mechanism for change of chassis clearance is placed in robot body. In case of very rough terrain with large irregularities, the robot can lift own body as prevention of collision with ground. In case when it moves on inclined plane, it can move down own body as prevention before the side overturning.

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## **AIRFLOW MEASUREMENT TEST DEVICE FOR AIRFLOW SENSORS**

(pages 17-21)

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**Keywords:** measurement, education, airflow, anemometer

**Abstract:** The paper deals with didactic model of test device for testing of airflow sensors and measurement equipment's. The test device contains from source of wind flow with regulator, flow channel with place for the testing of airflow sensors or anemometers. Students can have training with working with sensors and measurements equipment's and also experience with calibration and verification of sensors.

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## **GLUED JOINTS IN THE AUTOMOTIVE INDUSTRY**

(pages 23-28)

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**Keywords:** adhesive, glued joints, finite element method

**Abstract:** Glued joints appear in the automotive industry in many types, both in terms of functional stress and in terms of design. Glued joints appear in the automotive industry in many types, both in terms of functional stress and in terms of design. At present, car body plates are most often joined by resistance (spot, seam and projection) welding technology. These disadvantages include, for example, problematic joining of sheets of different thicknesses and qualities, or thermal influencing of the welded area. By using the bonding technology, we avoid these problems and we can take advantage of the many advantages it offers in the automotive industry. This paper gives an overview of the advantages of using glued joints in the automotive industry. It is devoted to the problem of strength calculation of these bonded joints.

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## EVALUATION OF RESIDUAL STRESSES USING OPTICAL METHODS

(pages 29-34)

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**Keywords:** optical methods, LF/Z-2, residual stresses, hole drilling

**Abstract:** The paper deal with quantification of residual stresses by the drilling method and design of the methodology of using optical device LF/Z-2 for their verification. The optical methods have been used for strain analysis for years, but with the continuous development of new and more accurate measuring instruments and devices, are solved the possibilities of creating new application methodologies. For using the Optical PhotoStress method for quantifying residual stresses, has been designed an accurate positioning device to analyse the released deformations around the drilled hole in multiple steps as considering by ASTM E837-13a for drilling methods.

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