

LABORATORY COMMUNICATION

Brief introduction to the State Key Laboratory of Precision Measuring Technology and Instrument

The State Key Laboratory of Precision Measuring Technology and Instrument, one of the 75 state key laboratories included in the "Key subjects development project", was established with the approval of the State Planning Commission of China in 1990. The Laboratory puts together the preponderance of Tianjin University and Tsinghua University in the area of precision measuring technology and instrument. It passed the State's assessment and was opened to domestic and foreign scientists in 1995. Prof. Ye Shenghua, executive director of Measuring Society of China, is the director of the Laboratory and Li Tongbao, an academician of the Chinese Academy of Engineering, is the chairman of its Academic Committee which consists of 16 famous experts. The Laboratory has 30 faculty members, including 18 professors, 12 associate professors and 44 visiting researchers.

1 Main research areas

The Laboratory's main research areas are developing the techniques for precision measuring and instrumentation related to our national economy, including laser and opto-electronic measuring technology, error compensation, correction and separation technology in precision measuring, non-contact intelligent sensors and intelligent instruments, nanometer measuring technology, high precision measuring of minute dimension, dynamic monitoring and inspection of large dimensional mechanical quantities for engineering machines, micro opto-mechanical-electrical technology and system.

2 Main achievements

The Laboratory has completed 137 projects funded by national, provincial, ministerial, commission, and other organizations and units as well as international cooperation contracts. They include 8 strategic projects in the "Eighth 5-years plan of the nation", 5 strategic projects in the "Ninth 5-years plan of the nation", 5 "863 Hi-Tech projects", 1 key project and 29 general projects of the National Natural Science Foundation of China, 31 projects from provinces, ministries or commissions, 7 international cooperation projects and 50 other projects.

The Laboratory has received many awards including 1 second-class and 3 third-class prizes for National Science and Technology Progress, 1 second-class and 2 third-class National Invention Prize, one first-class, 6 second-class and 10 third-class prize from provinces, ministries or commissions. Meanwhile, the Laboratory has also obtained 38 patents.

Most of the research achievements of the Laboratory are of advanced level in China, some in the world.

The project "Vision inspection technology and its application" presided by Professor Ye

Shenghua, won the second-class prize of National Science and Technology Progress. It studies the theory and key techniques in this field systematically and profoundly and applies the machine vision into the contemporary industrial quality inspection which incorporates with electronics, opto-electronic detection, image processing and computer techniques. Meanwhile, several applied researches have been accomplished, such as "car body in-white visual inspection system" developed for the First Automobile Group in Changchun, 863 project "IVECO visual inspection station", measuring instrument for the wire-drawing mould, etc.

The real time measuring system and method for side-gliding angle based on laser sector method, presided by Professor Li Dacheng, won the third-class National Invention Prize. "Displacement measuring device" etc., presided by Tianqian, obtained two patents of Japan.

The Laboratory has published numerous research papers, including 42 papers on foreign journals, 132 papers on Chinese scientific journals, 79 papers presented at international symposiums, 21 papers presented at national symposiums and 7 monographs. Among them, 25 papers have been indexed by SCI and 101 papers have been indexed by EI.

3 Talent cultivation

The Laboratory provides training programs leading to MS or Ph D degree. The research fields include precision measuring technology and instrument, optical instrument and precision mechanism and instrument, two postdoctoral training stations with the specialty of instrumentation are also available. Now, the Laboratory has 295 MS students, 274 Ph D students and 31 postdoctoral fellows. Two Ph D students were jointly supervised by the professor of universities abroad.

The research project about Ph D student training, with the topic "Creation ability is the key factor for Ph D student cultivation", won the second-class prize of National Education Achievement and the first-class prize of Education Achievement of Tianjin Municipality.

4 International cooperation and exchange

The Laboratory has established cooperation relationship with many universities and research institutes abroad, such as USA, German, Japan, Russia, Finland and Israel. Prof. Zhang Guoxiong was the executive chairman of 1997's annual meeting of International Manufacturing and Engineering Society, in that conference, 343 foreign scholars and nearly 60 Chinese scholars participated. Sponsored by the Science Foundation of Germany, the Laboratory and the Metrology Science Institute of China, organized the publication of several monographs including "Three-coordinate Measuring Machine", "Nanometer Measuring Technology", "Contemporary Interferometry Technology". And a research center of Coordinate Measuring Machine was also established by this joint effort. In addition, a Dot-dripping instrument was developed in cooperation with Kingston University of USA.

In recent three years, the Laboratory has sent 10 visiting scholars abroad and invited nearly 30 foreign scholars for lecturing, and supported nearly 40 persons to attend international symposiums. Five famous scholars have been invited as visiting professors.

5 Main instruments

The Laboratory is equipped with many advanced research instruments including atomic force

microscope system AUTOPNDE for micro-measurement on nanometer level, the laser interferometry measuring system M10 for measuring surface coarseness of metal and non-metal, optical multi-channel detection instrument 1530-PUNOMA4 for image processing and sampling under weak light, the work station for large scientific computing, CAD for mechanism and circuit simulating, an electrical theodolites station for large coordinate system research, an infrared heat-image instrument TVS-2200 for the inspection of engineering mechanical movement and detection of the heat distribution of micro-integrated system.

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