

**Special Issue**

## Precision Engineering as the Basis of Japanese Space Technologies—From “Hayabusa” to Car Navigation Systems—

**Address by the President**

Precision Engineering to Support Aerospace Related Technologies

—Aiming towards Open Academic Society for Manufacturing— Toshimichi MORIWAKI ..... 1

**Lecture**

- The Rise of MEMS Gyroscope in Mobile Control Hideo KUMAGAI ..... 8
- Development of Mobile Robots for Lunar/Planetary Exploration Kazuya YOSHIDA ..... 12
- Ultra Fabrication Technologies of Large Telescope Lenses for JEM-EUSO Creating New Astronomy Hitoshi OHMORI, Yousuke HACHISU, Kouki MAEKAWA, Naoki TONE, Yoshihiro UEHARA and Yoshiyuki TAKIZAWA ..... 16
- Space Development in the Private Enterprise Tsutomu UEMATSU ..... 21
- Approach on Low-carbon Society by Advanced Telematics Service Takuro MASUDA, Takeshi IMAI, Yuichiro ISHIDO and Koji SENGOKU ..... 25
- For Successive Success of HTV Yoichiro MIKI, Kazumi MASUDA, Hiroshi SASAKI and Yoshinori SUNASAKA ..... 29
- Development and Operation of the Micro-satellite “MAIDO-1” Hiroshi OKUBO ..... 33
- Research and Development of Nano-satellites Shinichi NAKASUKA ..... 37
- Development of a High-definition Television System Onboard Lunar Explorer Kaguya Junichi YAMAZAKI ..... 42
- Program Evolving On-board Computer for Small Satellite—Deriving Strong Point from Weak Point : Utilization of Bit Inversion by Space Radiation— Keiki TAKADAMA ..... 46

■ My Experience in Precision Engineering Sadamasa ANMI ..... 56

■ Gravure & Interview JAXA ..... 3  
Junichirou KAWAGUCHI  
Interview : Hiroyasu IWABE/Yutaka KAMEYAMA/Junichi MURAKOSO

■ Student Forum Punching Technology for Shaping the Future ..... 51

■ Introduction of Laboratories Umezu Lab., Dept. of Mechanical Engineering, Tokai University ..... 62  
Precision Laboratory, Department of Mechanical Engineering, Osaka Institute of Technology ..... 64

- JSPE Affiliate News ..... 57
- JSPE Autumn Conference, 2010 Report ..... 126
- JSPE Report ..... 129
- Information ..... 131
- From the Lecture Committee ..... 告 1-1
- Editor's Note ..... 告 1-8

## Paper

- **Velocity Measurement Algorithm with Adaptation Function** ..... 67  
Yukihiro TAGAWA, Hiromitsu HIKITA, Naohiko HANAJIMA and Mitsuhsa YAMASHITA
- **Influence of Ball Behavior in Ball Screws on Lost Motion (2nd Report)** ..... 73  
—Lost Motion and Ball Wedging Behavior under Varied Preload with Double Nut or Over-sized Balls—  
Masahiro UEDA and Hirokazu SHIMODA
- **Wavefront Measurement of Contact Lenses by Point Diffraction Interferometer** ..... 79  
Satoshi KAKUNAI and Nahoko KOSAKA
- **A Force Sensor Integrated Fast Tool Control System** ..... 85  
—System Design and In-Process Measurement of Thrust Force—  
YoungJin NOH, KangWon LEE, Yoshikazu ARAI and Wei GAO
- **Motion Stereo including Tracking Stability Analysis for Eye-in-Hand Systems** ..... 90  
Yukiyasu DOMAE, Haruhisa OKUDA, Hidenori TAKAUJI, Shun'ichi KANEKO and Kazuhiko SUMI
- **Chatter Stability Limits in End Milling with Anisotropic Flexible Tools** ..... 97  
Yusuke KURATA, Norikazu SUZUKI, Rei HINO and Eiji SHAMOTO
- **Effects of Microstructures of Ti (C, N) Based Cermets Containing WC on Cutting Performance** ..... 105  
Takashi YOSHIMOTO, Kazuhiro SHINTANI, Teppei NAGANO, Masao KOSHI, Takashi MATSUNAGA and  
Yuu OOMURA
- **Fabrication of Self-lubricative Sintered Tungsten Carbide Body by the Addition of Carbon Onion** ..... 111  
Ippei NAKAGAWA and Atsushi HIRATA
- **Study on High Efficiency Mirror Finished Technique of Single-crystal SiC Substrate** ..... 116  
—The Planarization Process by Constant-pressure Grinding and an Ultraviolet Irradiation Assisted Polishing—  
Keishi YAMAGUCHI, Mutsumi TOUGE, Akihisa KUBOTA, Takayuki NAKANO and Junji WATANABE
- **Efficient 5-axis Control Drilling for a Large Number of Holes** ..... 121  
Kouji HASEGAWA, Keiichi NAKAMOTO, Tohru ISHIDA and Yoshimi TAKEUCHI