Principal Researcher	Satoshi Kiyono	**Number of Researchers**	4
Research Institution・Department・Title	Professor, Graduate School of Engineering,Tohoku University	**Location of Institution**	Sendai

Title of Project	Development of a surface encoder for next generation three-axis precision stages
Abstract of Research Project	A surface encoder, which combines a two-dimensional (2D) angle grid and a 2D angle sensor is to be developed. The feasibility of the surface encoder for practical use will be confirmed through testing the performance when it is designed and built into a surface motor. The research items include the optical system, the angle grid, the signal detection system, the surface motor and the closed-loop feedback control with the use of the surface encoder. The high-speed scanning technique multi-spot light beams, the fabrication technique of large area angle grids with short pitches, the high-speed signal detection technique, the technique of embedding the surface encoder into the surface motor and the feedback control technique suitable for the surface encoder will be established in the research. The results of the research are expected to put the surface encoder into practical use, leading to various new applications of surface motors. The research also has a potential of generating a new field of industry.
References	1) Satoshi Kiyono, Ping Cai and Wei Gao, An angle-based position detection method for precision machines, JSME International Journal,42-1(1999),44-48 2) Satoshi Kiyono, Wei Gao, Masaya Kanai, Tadashi Hoshino and Yuki Shimizu, A new method of position detection using an optical scanning angle sensor, Journal of Japan Society for Precision Engineering, 67-3(2001)、493-497.(in Japanese)
Term of Project	Fiscal years 2002-2006. (5 years)

Budget Allocation (in thousand of yen)	FY2002	FY2003	FY2004	FY2005	FY2006	Total
	31,500	17,700	16,200	10,500	7,600	83,500

Homepage Address	http://www.nano.mech.tohoku.ac.jp