

LDIA 2011

**The Eighth Symposium on
Linear Drives for Industry Applications**

BOOK OF ABSTRACTS

**July 3-6, 2011
Eindhoven, The Netherlands**

Organized by:
Eindhoven University of Technology

TU/e Technische Universiteit
Eindhoven
University of Technology

Foreword

Linear drives technologies are advancing rapidly into our everyday lives, increasing our daily comfort, prosperity, health, environment and quality of life. The technological requirements for making very accurately but fast small products or reliable transportation of goods and people raise a host of challenging technical problems, which cut across many different disciplines. This, in turn, drives the need for very effective interdisciplinary research, and national and international collaboration to address these challenges. These technological issues and their possible solutions will be comprehensively addressed at this Eighth International Symposium of Linear Drives for Industry Applications, LDIA 2011.



LDIA 2011 links industry to research and academia across more than 20 countries in an influential and extended network of people involved in the development, application and implementation of these linear-drive engineering technologies. The 16 technical sessions of this international symposium will cover new developments and research in process technologies, transportation systems, lithography, pick-and-place machines, electronic microscopy, micro and nano engineering, actuators and sensors, modeling techniques and anti-vibration devices in ultra-high precision systems.

We have received 135 abstracts from more than 20 countries and the conference contributions have been selected by an international board for oral or poster presentations. All presented papers have been collated in these proceedings.

We thank our colleagues on the international and local organizing committees for all their help and assistance. We also thank our sponsors and the Department of Electrical Engineering from the Eindhoven University of Technology for their support for the symposium.

It gives me great pleasure, on behalf of the LDIA council, to welcome you to the 8th International Symposium at Congress Centrum of Eindhoven University of Technology, one of Europe's best technically advanced conference venues. We look forward to meeting with you in a stimulating and interesting environment, where all ideas could be discussed, new acquaintances could be made, and where new ideas and new collaborations will be conceived.

Eindhoven, July 2011

Elena Lomonova, Program Chair

Technical program

Timetable

Monday July 4	Blauwe zaal	Auditorium 4
	9:00 - 9:50	Opening ceremony and plenary keynote session I
9:50 - 11:30	Magnetic Levitation and Transport I (MLT-I)	Linear Induction Motors I (LIM-I)
11:30 - 12:30	Plenary poster Session I (PS-I)	
12:30 - 14:00	Lunch	
14:00 - 15:20	Linear Tubular Motors (LTM)	Actuators & Special Machines I (ASM-I)
15:20 - 15:50	Coffee break	
15:50 - 17:30	Linear Induction Motors II (LIM-II)	Modeling (MOD)
Tuesday July 5	Blauwe zaal	Auditorium 4
9:00 - 9:40	Plenary keynote session II	
9:40 - 11:20	Magnetic Levitation and Transport II (MLT-II)	Linear Motors (LMO)
11:30 - 12:30	Poster Session II (PS-II)	
12:30 - 14:00	Lunch	
14:00 - 15:20	Control of Synchronous Motors (CSM)	Linear Transverse Flux Machines (LTF)
15:20 - 15:50	Coffee break	
15:50 - 17:10	Linear Switched Reluctance and Stepper Machines (LSS)	Actuators and Special Machines II (ASM-II)
17:10 - 17:30	Plenary closing session	

Plenary sessions

Opening ceremony

Date Monday, Jul. 4, 9:00 - 9:10
Location Blauwe Zaal
Session Chair E.A. Lomonova



Opening speech

C.J. van Duijn
Rector Magnificus of Eindhoven University of Technology

Keynote Sesssion I

Date Monday, Jul. 4, 9:10 - 9:50
Location Blauwe Zaal
Session Chair E.A. Lomonova



Linear Drives: an enabling technology for cost effective continuation of Moore's Law

Jos Benschop
Senior Vice President Technology at ASM Lithography, Veldhoven, The Netherlands

Abstract

Moore's Law dictates that every 18 months the number of transistors on an integrated chip doubles. This is first and foremost enabled by optical lithography printing ever smaller transistor on an integrated circuit.

ASML is market and technology leader in this multi-billion euro industry. State-of-the art immersion scanners, using 193 nm light and immersion optics with numerical aperture of 1.35, print 40 nm wide lines on a 300mm resist coated silicon wafer. To enable a cost-effective continuation of Moore's law the productivity of these optical lithography scanners have increased steadily over the last decades. Today's pixel rate exceeds 2 Terapixel/second. The combination of sub-nm precision and high acceleration continues to push the envelope of sensor-, actuator- and servo-technology as well as construction of linear drives.

After an introduction into IC fabrication, and the role of lithography, it will be explained how lithography, and linear drives used for lithography, have evolved over the years enabling a cost effective continuation of Moore's law. Key challenges for lithography as well as linear drive technology will be shared.

Keynote session II

Date Tuesday July 5, 9:00 - 9:40
Location Blauwe Zaal
Session Chair J.C. Compter



15 Years of heavy duty linear drives in Material Handling

Gert Bossink
Vanderlande Industries BV, Veghel, The Netherlands

Abstract

Vanderlande Industries is a market leader in automated material handling solutions. In market segments like Baggage Handling, Parcel Sorting and Automated Warehouses we deliver complete solutions. When we installed 15 years ago a complete baggage handling system based on carts driven by linear asynchrone drives we felt pioneers that had to develop crucial elements. Nowadays we deliver systems to major airports based on this technology and synchrone and asynchrone drives are applied in all our market segments in various applications.

Closing Ceremony

Date Tuesday July 5, 17:30 - 17:45
Location Blauwe Zaal
Session Chair J.W. Jansen