

---

---

September 2001

Rock River Valley Section  
ieee.flask.com/

Event

Sense

The Institute of Electrical and Electronic Engineers, Inc.

---

---

Joint ASME//Computer/Control Systems, IAS, PELS Chapters Mtg

## Recent Developments of Bearingless/ Self-Bearing Drives

### When

Thursday, October 4, 2001

### Where

Linus, 5611 E State St, Rockford, 815-397-2077. Linus is at the intersection of State St. and Arnold Ave, about 0.5 mile west of Mulford and State.

### Agenda

- 6:00 PM Tour Begins
- 6:30 PM Dinner
- 7:30 PM Presentation

### Program

In recent years, extensive developments of bearingless motors have been done for the applications of blood pumps, computer disk spindles, canned pumps, etc. Bearingless motors combine a function of radial magnetic bearing with a torque generating function. Thus, possible applications are high rotational speed motors and generators, or some drives in special circumstances like vacuum environments, high or low temperature conditions.

In this dual presentation, Dr. Chiba and Dr. Okada will review developments and principles of bearingless drives, in-

cluding:

Principles of bearingless PM machine through graphics, induction type bearingless machines with FEM graphics, and a Radial Force Detection and Feedback Effect on bearingless Motors; Principles of self-bearing axial, hybrid, Lorentz type motors. Applications include centrifugal heart pumps, axial flow pumps, and industrial applications.

### Speakers (pictures page 2)

**Yohji Okada** received BS, MS and Ph.D. degrees in Mechanical Engineering from Tokyo Metropolitan University. He joined Ibaraki University, Department of Mechanical Engineering in 1971. He is now a Full Professor. He was a visiting professor at Univ of Virginia from 1982-1983.

His research field includes Mechatronics, Magnetic Levitation, Magnetic Bearing, Vibration Control. Dr. Okada is a member of IEEE, ASME, JSME, IEEJ, SICE, AEM.

**Akira Chiba** received the BS., MS. and Ph.D. degrees

in Electrical Engineering from the Tokyo Institute of Technology, in 1983, 1985 and 1988, respectively.

In 1988, he joined the Science University of Tokyo and is now an Associate Professor. He has been studying bearingless drives, switched reluctance drives, super high speed synchronous reluctance motors.

### Meal/Reservations

Dinner choices are: Baked Lasagna, Chicken Parmigiana, Vegetable Platter. Please reserve your space, select your meal by **calling Gloria at 815-226-2513 by Monday, Oct 1, at 10am.** (Please include email address and meal selection in the information you provide Gloria - thanks). The cost of the dinner is **\$5 for members, \$13 for non-members, and \$2 for students.**

**Note** The meeting is open to the general public. You need not be an IEEE member. Guests are welcome. However, please call to enable us to make appropriate arrangements.

---

---

## Notice of Change to RRVS Newsletter Delivery

Beginning with the November '01 RRVS Newsletter, the delivery will change from hard copy to purely electronic. Email notification of availability of the newsletter at the newly updated section website (NOTE NEW WEB ADDRESS ON PAGE 1 IN UPPER RIGHT HAND CORNER OF THE TITLE BAR) will be sent to all members with whom we have a valid email address on file. So please make sure we have your email address. For those members without an email address and who would like assistance in obtaining one, please contact one of the RRVS Officers for assistance.

## Chicago/Rockford IEEE Consultants' Network Meeting

The next meeting will be on Monday, September 24, 2001. The optional informal dinner is at 6:15 PM at Bakers' Square (270 E. Northwest Highway and North Court), and the meeting at 7:30 PM at the Palatine Public Library (700 North Court, Palatine, IL 847-358-1216).

Instead of a speaker this month there will be an open discussion on "Know When to Hold, Fold, or Walk Away" and how to identify contractual problems and how to make them acceptable.

Members and non-members are invited to both the meeting and the optional dinner. Information about the network can be obtained at our web site <http://www.drblank.com/coaction.htm>



Dr. Akira Chiba

## October Meeting Preview

Advancements in AC industrial drives have been propelled through improvements in power electronics and control hardware. Improvements in IGBTs allowed faster switching speeds, which provides lower thermal losses. Digital signal processors and improved control algorithms allow AC drives to address applications previously handled by DC drives. Capacitive coupling between the IGBT, power structure and control platform components influence drive dynamics and contributes to signal and waveform distortion. This differential and common mode capacitance is often disregarded as "parasitics" and not considered in designing the control.

This paper decouples the major contributors to motor waveform distortion, analyzes them, quantifies them, and presents a correction strategy. Simulations validate the analysis and experimental results demonstrate the strategy's benefits.



Dr. Yohji Okada

## May Meeting Recap

Excellent nutrition was derived from the huge variety, content, and quality of food served at the annual elections/picnic section meeting in May. Voting was conducted for RRVS offices, the winners to take office beginning on January 1, 2002, as we move to synchronizing our election year to line up with the calendar year, per IEEE HQ's request. 4 different individuals ran for the elected offices, one for each office. Each person ran unopposed. Election results were: Chair — Chris Wrate; Vice Chair — Don Zinger; Secretary — Alkesh Patel; Treasurer — Larry Wachowiak.

## Submissions to *Event Sense*

Send articles and job ads to the *Event Sense* editor, Bob Parro, via e-mail (preferred), or fax. Job ads will run for two consecutive months. Contact the *Event Sense* editor if the ad needs to run longer. Please make submissions by the twenty-fifth of the month. All submissions are subject to editing for style, clarity, and space considerations.

e-mail: [b.parro@ieee.org](mailto:b.parro@ieee.org)  
fax: (815) 425-6919

## **2001 IEEE RRVS Executive Committee**



Chris Wrate  
Chair,  
cwrate@ieee.org  
815-633-7400



Prof. Don Zinger  
Vice Chair,  
NIU St Br Counselor  
d.zinger@ieee.org  
815-753-0540



Alkesh Patel  
Secretary,  
alkesh.patel@ieee.org  
815-394-2487



Larry Wachowiak  
Treasurer  
l.wachowiak@ieee.org  
815-397-9090



Bob Parro  
Joint Computer/Control  
Systems Chapter Chair,  
Newsletter Editor  
b.parro@ieee.org  
815-877-6670



Vietson Nguyen  
PELS Chapter Chair  
vnguyen@ieee.org  
815-394-3230



Jitendra Solanki  
IAS Chapter Chair  
J.Solanki@hs.utc.com  
815-394-5675



Joe Etminan  
Educational Activities Chair  
joe@ednet.rvc.cc.il.us  
815-654-5514

### **Northern Illinois University Student Branch Officers**



Shireen Allauddin  
Chair



Ami Patel  
Vice Chair



Joe Dowsett  
Secretary



John Thomas  
Treasurer

*Messages for student officers can be left at the NIU Dept of  
Electrical Engineering,  
(815) 753-9974 or e-mail at sb.niu@ieee.org*

**The Rock River Valley Section gratefully acknowledges the following  
companies and university for supporting Section Officers:**

**Hamilton Sundstrand • Northern Illinois University • Telelogic**



Rock River Valley Section  
Established 1947

**Electronic IEEE Membership Application**

An electronic online application is available at:  
[www.ieee.org/join.html](http://www.ieee.org/join.html)

**Update Your Own IEEE Member Contact Info Online**

Go to IEEE Web Registration at:  
[services1.ieee.org/membersvc/registration/intro.htm](http://services1.ieee.org/membersvc/registration/intro.htm)

## Calendar

- September Section Meeting** ..... **Oct 4**  
Dr. Akira Chiba and Dr. Yohji Okada will be speaking about Developments in Bearingless/Self-Bearing Drives
- October Section Meeting** ..... **Oct 25**  
Dr. Russell Kerkman will discuss Effects of Parasitics on the Control of Voltage Source Inverters
- November Section/Student Branch Meeting** ..... **Nov 29**  
Location will be NIU Engineering Building in DeKalb, IL, TBD topic



Joint Computer/  
Control Systems  
Society Chapter  
Established 1995



Industry  
Applications  
Society Chapter  
Established 1992



Power  
Electronics  
Society  
Chapter  
Established 1996

Non-profit Org.  
U.S. Postage  
**PAID**  
Rockford, IL  
Permit No.496

## Time-Sensitive Material

### Inside This Issue

- September Section Meeting Notice ..... 1
- Notice of Change to RRVS Newsletter Delivery ..... 2
- Chicago/Rockford Consultants Network Meeting ..... 2
- May RRVS Meeting Recap ..... 2
- October RRVS Meeting Preview ..... 2
- RRVS Website & Officer Contact Information ..... 3
- Calendar ..... 4