

REPORT 1998-1999

CAS Technical committee on Power systems and power electronic circuits

A. Activities in 1998-1999

1. In 1998 there were 15 papers and 5 transaction briefs concerning power systems and power electronics in CAS Transactions part I.

(An additional 6 papers had significant power systems and power electronics content; we see this overlap with other technical committees as healthy).

2. Ian Dobson organized a special session at ISCAS 1999  
NONLINEAR DYNAMICS IN POWER ELECTRONICS

GOAL: The session will foster and encourage the emerging research in bifurcations, chaos, spectral properties, and nonlinear control

in power electronics.

DISCUSSION: One of the main challenges of power electronic systems is their variable or hybrid discrete/continuous structure caused by the power electronic switchings and controllers.

Thus, in addition to displaying many of the more well recognized chaotic and nonlinear effects

power electronics systems also display special phenomena related to their variable structure.

The prospect of new understanding of power electronic systems together with the new nonlinear phenomenon caused by the variable

structure is causing excitement and enthusiasm in several research groups

around the world.

Moreover, researchers are looking for opportunities to exploit nonlinear effects such as chaos to practical ends.

That is, instead of trying to avoid exotic nonlinear effects in power electronic circuits,

can these effects be quantified, controlled and then harnessed for practical use?

3. Henry Chung, Adrian Ioinovici and Issa Batarseh organized special sessions at ISCAS 1999:

DESIGN AND APPLICATIONS OF POWER ELECTRONIC CIRCUITS-I and II

RATIONALE: Due to the application-oriented nature of power electronics,

the papers are emphasized on two major aspects which are the design and

applications of power electronics converters.

These special sessions focus on the modeling of recently developed converters or control schemes, including zero-voltage-transition converters, switched-capacitor cells, application of genetic algorithms, and

feedforward, sliding mode and H-infinity controls.

4. We participated in the paper review process for the CAS Transactions.

5. A WWW page for the technical committee was initiated and linked to the CAS society web page.

B. Plans for 1999-2000:

1. The next annual meeting of the technical committee is scheduled on Tuesday, June 1, 1998 at noon at ISCAS 99, in Orlando. Future directions and plans for ISCAS 2000 will be discussed.

2. Update and improve the WWW page and member email list.

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