BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 21 EXTRA **ONSDAGEN DEN 28 MAJ 2003**

BRÅKET

Veckobladet från Institutionen för matematik vid Kungl Tekniska Högskolan och Matematiska institutionen vid Stockholms universitet

Redaktör: Gunnar Karlsson

Telefon: 08-790 84 79

Adress för e-post: gunnarkn@math.kth.se

Bråket på Internet: http://www.math.kth.se/braaket.html eller http://www.math.kth.se/braket/

Postadress:
Red. för Bråket
Institutionen för matematik
KTH
100 44 Stockholm

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Sista manustid för nästa nummer: Torsdagen den 5 juni kl. 13.00.

Detta extranummer

utkommer för att Bråkets läsare skall bli informerade om några seminarier under veckan 2 – 6 juni som inte kom med i det ordinarie numret, därför att e-post-meddelandena om dessa seminarier inte nådde redaktören i tid.

SEMINARIER

Ti 06–03 kl. 14.00 – 15.00. Mittag-Leffler Seminar. Mikhail I. Zelikin, Moscow State University, Russia: *Operator cross-ratio on infinite-dimensional Sato's Grassmannian.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 2.

Ti 06–03 kl. 15.30 – 16.30. Mittag-Leffler Seminar. Yishao Zhou, Stockholm University: *Carleman linearization, polynomial systems and observability.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 2.

To 06–05 kl. 14.00 – 15.00. Mittag-Leffler Seminar. Christopher I. Byrnes, Washington University, St. Louis, Missouri, USA: *Shaping the steady state responses of nonlinear control systems.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 2.

To 06–05 kl. 15.30 – 16.30. Mittag-Leffler Seminar. Alexei S. Matveev, St. Petersburg State University, Russia: *Illposedness of standard optimal control problems by perturbation of time delay.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 3.

Fr 06–06 kl. 10.15. Presentation av magisteravhandling (Uppsala). Erik Melin: *Connectedness and continuity in digital spaces with the Khalimsky topology.* Sal 2144, Matematiska institutionen, Polacksbacken, Uppsala universitet.

MITTAG-LEFFLER SEMINAR

Mikhail I. Zelikin:
Operator cross-ratio on infinite-dimensional Sato's Grassmannian

Abstract: The notion of matrix cross-ratio of four n-dimensional subspaces of $2n$-dimensional ambient space is generalized to any dimension of subspaces and to the infinite-dimensional Sato's Grassmannian, playing the leading part in the theory of integrable infinite-dimensional Hamiltonian systems. Cohomological properties of this generalized cross-ratio are discussed. The Zeta-function of the cross-ratio on Sato's Grassmannian is defined, giving integrals of KP-hierarchy of integrable partial differential equations. These results are motivated by control theory, and they are expected to be applied in this context.

Tid och plats: Tisdagen den 3 juni kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

MITTAG-LEFFLER SEMINAR

Yishao Zhou:
Carleman linearization, polynomial systems and observability

Abstract: Consider a linear system $\dot{x} = Ax, \;\; y = p(x)$. Using Carleman linearization techniques a linear system is produced with linear output. The output trajectories of the linear system contain the set of output trajectories of the system with polynomial output. The observability of the linearization is studied and minimal linearizations are obtained. To extend these results to polynomial systems is interesting. There the linearization becomes infinite-dimensional. Preliminary results are obtained that show that there are low-dimensional systems, defined in terms of the derivatives of the output, that observe the system.

Tid och plats: Tisdagen den 3 juni kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

MITTAG-LEFFLER SEMINAR

Christopher I. Byrnes:
Shaping the steady state responses of nonlinear control systems

Abstract: Recent work on output regulation for nonlinear systems has succeeded in formulating and analysing this classical problem for finite-dimensional nonlinear systems using important concepts and tools from nonequilibrium nonlinear dynamics, such as the notion of the omega limit of a set and its role as an attractor for bounded sets of initial conditions. One source of design methodologies for feedback laws solving this problem has come from a necessary condition embodying the internal model principle in the nonequilibrium setting. This condition is expressed in terms of the zero dynamics of the plant and the combined plant-exosystem dynamics. In this talk we illustrate the use of these techniques for infinite-dimensional linear and nonlinear systems. This entails the enhancement of zero dynamics for nonlinear boundary value problems and its use to design feedback laws for a class of nonlinear distributed parameter systems whose zero dynamics have nontrivial compact attractors.

Tid och plats: Torsdagen den 5 juni kl. 14.00 – 15.00 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

MITTAG-LEFFLER SEMINAR

Alexei S. Matveev:
Illposedness of standard optimal control problems by perturbation of time delay

Abstract: The time delay optimal control problem is a good option to model a wide range of real-life phenomena. Unfortunately solution of such problems encounters hard troubles in even the simplest cases. This impels to employ instantaneous models whenever the delay is small. The conventional way to do so is by ignoring the delay effects. Is this correct? To get an answer, I consider infinitely small (i.e., converging to zero) delays and analyse the error that accrues from their neglecting. At the first sight, the outcome of such an analysis can be easily foreseen and comes to the platitude: the error must be infinitely small as well. This is true indeed if the delay occurs only in the state. However, in the case of the delayed control, this platitudinous property fails to be true not only in general but also "almost always". Then the natural way to ignore the delay results in an ill-posed model and so is not acceptable. In this talk, this ill-posedness phenomenon is discussed and well-posed instantaneous approximations for optimization problems with small delays are offered.

Tid och plats: Torsdagen den 5 juni kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.