

# Magnetic Bearing Online Seminar

by



DELTA JS AG

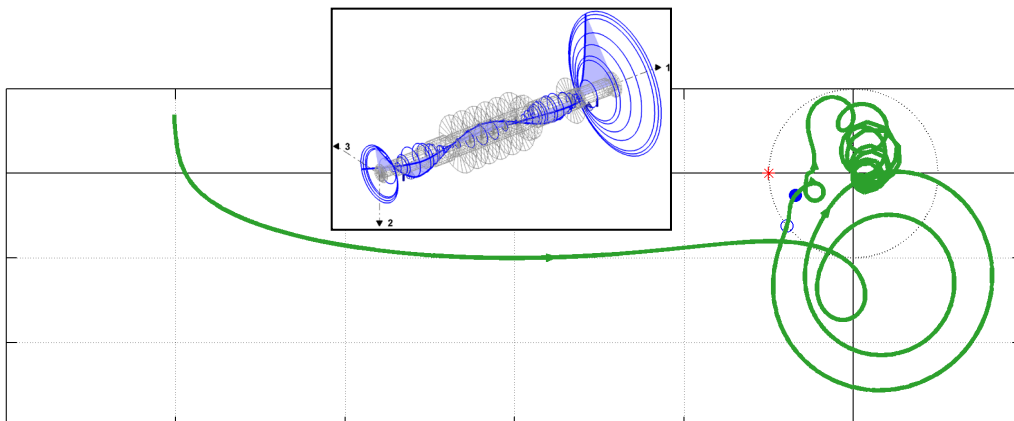
**on June 19<sup>th</sup> and 20<sup>th</sup> 2023**

DELTA JS is a leading engineering and consulting firm for rotor dynamics. Its proprietary, commercial software MADYN 2000 is widely used for industrial machinery to simulate rotor dynamics of complex rotor-gear-bearing systems with all types of bearings including active magnetic bearings.

The seminar is based on the experience of the DELTA JS engineering team with magnetic bearing applications in various types of machines. Among others DELTA JS has been involved in the pioneer work of applications in large industrial turbo compressors. Practical relevance therefore is ensured. The seminar explains the most important properties of magnetic bearings, the practical design of controllers, special features and some basics about back up bearings. Attendees will have the opportunity of hands-on controller design with the help of MADYN 2000.

Who should attend? A thorough understanding of magnetic bearings is provided allowing the assessment of problems and risks involved in magnetic bearing applications. Thus, the seminar is suited for rotating equipment specialists of machine end-users and contractors as well as for design engineers, commissioning engineers, sales engineers and project managers of machine manufacturers and plant constructors.

The course instructor is Dr. Joachim Schmied, who is the founder of DELTA JS. He earned his doctorate at the Technical University of Darmstadt's Institute for Machine Dynamics in Germany. Before founding DELTA JS he has worked for twelve years in the turbomachinery industry, nine years as a development manager. Dr. Joachim Schmied has been a member of several scientific committees such as the "International Symposium on Magnetic Bearings" and the "International Federation for the Promotion of Mechanism and Machine Science (IFTToMM)" and is the author of various path breaking papers in rotor dynamics.



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## Contents of the Seminar (2 days):

- Introduction to Magnetic Bearings
  - Overview (advantages, machine designs, principle, components, general properties)
  - Detailed Properties (load capacity, basic formulas, dynamic characteristics, digital controller behaviour)
  - Controller Design (objectives, difficulties, design approach, rotor assessment, controller building blocks, coupling of axes and bearings)
  - Special Features (synchronous control, overload handling)
  - Back Up Bearings (design, behaviour in case of a drop)
  - Learning from some Experience
- Rotor Dynamic Analyses for Magnetic Bearing Applications
  - Analyses for the Rotor Assessment (critical speed map, natural modes of the free rotor, damping and stiffness variation of the bearings)
  - Modelling the Bearing, Practical Controller Design
  - Analyses of the Closed Loop System (stability, sensitivity, Campbell diagram, unbalance response)
  - Assessment of the Results (robustness, load capacity)

After each block there will be time for discussions. All attendees will receive seminar documents in English.

## Fee and Payment

**Seminar (2 days): CHF 1'600**

Invoice will be issued upon registration.

## Organisational Information

The seminar will take place online. Registered participants will receive a link to log into the seminar. The documentation will be distributed as PDF documents beforehand.

The seminar will take place over a period of 8 hours on each day starting at 9:00 Swiss time. Pure presentation time per day will be about 4 hours. Between sections of the seminar time to answer questions is foreseen. At the end of each block practical problems of real machinery will be discussed. The description of the problems is part of the documentation. Between blocks and over lunch time there will be breaks. A detailed time schedule will be distributed in advance.

For the practical controller design the participants will receive a download link to install MADYN 2000 with a temporary licence and examples.

**Registration: [Online](#) or e-mail to DELTA JS AG**

Deadline for binding registration is June 14<sup>th</sup>.

Name:	Mrs./Mr.		
Company:			
Department:			
Address:			
Phone:		Fax:	
E-mail:			

DELTA JS reserves the right to cancel the seminar in case too few people sign up at this date.