



WIEFP

2022



NOVEMBER 22-23 ■ SÃO PAULO ■ BRAZIL

The WIEFP is a Swedish-Brazilian initiative started in 2012

whose focus is **to promote collaboration in the** development of

**technologies, education, innovation management, and
methods and tools for hydraulic and pneumatic system**

development and design, aiming to **bring together**

industry and academia interested in this evolving

multidisciplinary field of fluid power, driver, actuation, and control systems

present in almost all industrial sectors.

WIEFP2022 – Outline and Summary

| | |
|--------------------------------|---------|
| Organizing Committee | 3 |
| Scientific Committee | 4 |
| Panelists and Moderators | 5 |
| Program | 6 - 13 |
| Presenters and Panelists | 14 - 15 |
| Participants | 16 – 19 |

WIEFP2022 - Organizing Committee

• General Co-chairs

- Victor J. De Negri, UFSC, Brazil
- Petter Krus, Linköping University, Sweden
- Luciana Pereira, UFABC, Brazil



• Chair CISB

- Alessandra Holmo, CISB, Brazil



• Chair CSHPA/ABIMAQ

- Maurício Garcia



• Conference Administrators

- Vinícius Vigolo, UFSC, Brazil
- Edmilton Stein, UFSC, Brazil



Support



WIEFP2022 - Scientific Committee

- Thomas Heeger, Linköping University, Sweden
- Samuel Kärnell, Linköping University, Sweden
- Rafael Rivelino da Silva Bravo, IFSC, Brazil
- Marcos Paulo Nostrani, UFSC, Brazil
- Vinícius Vigolo, UFSC, Brazil
- Dimitri Oliveira e Silva, UNIFESSPA, Brazil

- Liselott Ericson, Linköping University, Sweden
- Alessandra Cristina Santos Akkari, IFSul, Brazil
- Emilia Villani, ITA, Brazil

- Luiz Carlos Sandoval Góes, ITA, Brazil
- Antonio Carlos Valdiero, UFSC, Brazil
- Thiago Boaventura, USP/São Carlos, Brazil
- Henrique Raduenz, Volvo CE, Sweden

WIEFP2022 - Panelists and Moderators



Prof. Alessandra Akkari
Sul-Rio-Grandense Federal Institute (IFSul)
Brazil



M. Sc. Carlos Augusto Constantino
EMBRAER
Brazil



M. Eng. Diogo Vinícius João
CERTI Foundation
Brazil



Prof. Emilia Villani
Aeronautics Institute of Technology (ITA)
Brazil



Dr. Henrique Raduenz
Volvo CE AB
Sweden



Prof. Katharina Schmitz
RWTH Aachen university
Germany



Prof. Kim Stelson
University of Minnesota
USA



Prof. Luiz C. S. Góes
Aeronautics Institute of Technology (ITA)
Brazil



Eng. Mario F. Valdo
SmartSide
Brazil



JO. Paul Bogatir
Hudiksvall Hydraulics Cluster (HHK)
Sweden



Eng. Waldir Vianna
Mitsubishi Chemicals Group
Brazil

WIEFP2022 - Program


| Time | Tuesday, Nov 22 | Wednesday, Nov 23 |
|--|---|---|
| 08:00-08:30 | Registration | Registration |
| 08:30-08:40 | Welcome | Short-Courses B |
| 08:40-10:00 | Session 1 - New Components and Circuits | |
| 10:00-10:20 | Coffee Break | Coffee Break |
| 10:20-12:30 | Session 2 - Electrification and Digital Transformation | Session 4 - Aircraft and Mobile Applications |
| 12:30-13:45 | Lunch interval | Lunch interval |
| 13:45-16:00 | Session 3 - Innovation and Management | Session 5 - Energy Generation and Efficiency |
| 16:00-16:30 | Coffee Break | Coffee Break |
| 16:30-18:30 | Short-Courses A | Short-Courses C |
| 18:30 | Social Gathering | Concluding Remarks |
| Online transmission and in-person attendance | | |
| In-person attendance | | |

08:00-08:30 **Registration**

| | | | | | |
|-------------|----------------|-------------------------|-----------|--------------|--|
| | | Victor De Negri | Professor | UFSC | |
| | | Petter Krus | Professor | LiU | |
| 08:30-08:40 | Welcome | Luciana Pereira | Professor | UFABC | |
| | | Alessandra Holmo | Director | CISB | |
| | | Maurício Garcia | President | CSHPA | |

08:40-10:00 **Session 1 - New Components and Circuits - Chairperson: Samuel Kärnell**







| | | | | | |
|-------------|--|--------------------------|----------------------|----------------|---|
| 08:40-09:10 | Pneumatic Equipment with Constant Monitoring | Fábio R. Oliveira | Application Engineer | CAMOZZI |  |
|-------------|--|--------------------------|----------------------|----------------|---|

| | | | | | |
|-------------|---|----------------------|------------|-----------------------------|---|
| 09:10-09:30 | Optimization of Pressure Relief Grooves for Multi-Quadrant Hydraulic Machines in Different System Architectures | Thomas Heeger | Researcher | Linköping University |  |
|-------------|---|----------------------|------------|-----------------------------|---|







| | | | | | |
|-------------|--|-----------------------|---------------------|--------------|---|
| 09:30-10:00 | Improving Your System Design with Pressure Intensifier | Ricardo Araujo | Commercial Director | Bahri |  |
|-------------|--|-----------------------|---------------------|--------------|---|

10:00-10:20 **Coffee Break**

10:20-12:30 Session 2 - Electrification and Digital Transformation - Chairperson: Petter Krus

| | | | | | |
|-------------|---|-----------------------------|----------------------------|-----------------------------|---|
| 10:20-10:50 | The Digitization of Pneumatic Automation and Its Impacts on Energy Efficiency (In Portuguese) | Paulo Roberto Santos | Innovation Director | Zorfatec |  |
| 10:50-11:10 | A Novel Multi-Pump System for Hydraulic Actuation in Electric Mobile Machinery | Artur T. C. Gama | Researcher | Linköping University |  |
| 11:10-11:40 | Extend the Life Of Your Hydraulic System With HYDAC' s Smart Fluid Connection Software | Marcel Magre | Service Automation Manager | HYDAC |  |
| | | Diogo Vinícius João | Researcher | CERTI Foundation |  |
| 11:40-12:30 | Discussion Panel: Electrification and Digital Transformation | Katharina Schmitz | Professor | Aachen University |  |
| | | Emilia Villani | Professor | ITA |  |
| 12:30-13:45 | Lunch Interval | | | | |

13:45-16:00 Session 3 - Innovation and Management - Chairperson: Luciana Pereira

| | | | | | |
|-------------|---|----------------------------|------------------------------|--------------------------------------|---|
| 13:45-14:05 | The History and Future of Fluid Power Pumps and Motors | Samuel Kärnell | Researcher | Linköping University |  |
| 14:05-14:35 | Predictive Analytics - Definition Functionality and Benefits | Alex Lima | Sales Machinery Applications | Bosch Rexroth |  |
| 14:35-14:55 | Frugal Approach for The Design of a Lower Limbs Rehabilitation System Using Pneumatic Actuators | Rubén D. S. Bolaños | Researcher | UFSC |  |
| | | Paul Bogatir | Cluster Manager | Hudiksvalls Hydraulikkcluster |  |
| 14:55-16:00 | Discussion Panel: Entrepreneurship in a Sustainable Transition | Waldir Viana Jr. | Manager Director | Mitsubishi Chemicals |  |
| | | Alessandra Akkari | Professor | IFSul |  |
| 16:00-16:30 | Coffee Break | | | | |

Tuesday, Nov 22

16:30-18:30 Short-Courses A

16:30-18:30 On-Line Monitoring of The Hydraulic System and Its Advantages (In Portuguese) **Marcel Magre** Service Automation Manager  

16:30-18:30 Force and Impedance Control of Hydraulically-Actuated Robots **Thiago Boaventura** Professor  LEGGED ROBOTICS GROUP 

18:30-21:00 Social Gathering

Wednesday, Nov 23

08:00-08:30 Registration

08:30-10:00 Short-Courses B

08:30-10:00 Proactive Maintenance Engineering in Hydraulic Systems (In Portuguese) **João Luiz de Amorim Luciano Guimarães** Engineers  

08:30-10:00 Sizing and Dynamic Properties of Hydro-Mechanical Transmissions for Mobile Machines **Liselott Ericson** Professor  

10:00-10:30 Coffee Break





10:30-12:30 Session 4 - Aircraft and Mobile Applications - Chairperson: Liselott Ericson

| | | | | | |
|-------------|---|-----------------------------------|-------------------------------|--------------------------------|---|
| 10:30-10:50 | An Estimator for Aircraft Actuator Characteristics Using Singular Value Decomposition | Felix Larsson | Researcher | Linköping University |  |
| 10:50-11:10 | Thermohydraulic Modeling of An Electro-Hydraulic Servo Actuator on Damped Mode | Marina B. Pintarelli | Researcher | ITA/ EMBRAER |  |
| 11:10-11:30 | Digital Hydraulic Actuators: A Research Overview for Aircraft Control Surfaces | Dimitri O. Silva | Researcher | UNIFESSPA |  |
| | | Kim Stelson | Professor | University of Minnesota |  |
| 11:30-12:30 | Discussion Panel: Efficient Hydraulic Systems in Off-Highway Vehicles | Carlos Augusto Constantino | Flight Control System Manager | EMBRAER |  |
| | | Luiz Góes | Professor | ITA |  |
| 12:30-13:45 | Lunch Interval | | | | |

13:45-16:00 Session 5 - Energy Generation and Efficiency - Chairperson: Victor De Negri

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|-------------|---|-------------------------|---------------------------------|---------------------------|---|
| 13:45-14:05 | Energy Efficiency Analysis and Experimental Test of a Closed-Circuit Pneumatic System | Fedor Nazarov | Researcher | TU Dresden |  |
| 14:05-14:35 | Driving Digital Transformation – Pneumatic Solutions | Gerson Silva | Business Development Manager | Emerson Automation |  |
| 14:35-14:55 | Development of Pneumatic Technology for Automation and Control of Small Hydropower Plants | Vinícius Vigolo | Researcher | UFSC |  |
| | | Henrique Raduenz | Engineer | Volvo C.E. AB |  |
| 14:55-16:00 | Discussion Panel: Hydraulic Systems Applied in Wind Turbines | Mario Valdo | CEO | SmartSide |  |
| | | Roberto Veiga | President - Wind Energy Council | Abimaq |  |
| 16:00-16:30 | Coffee Break | | | | |

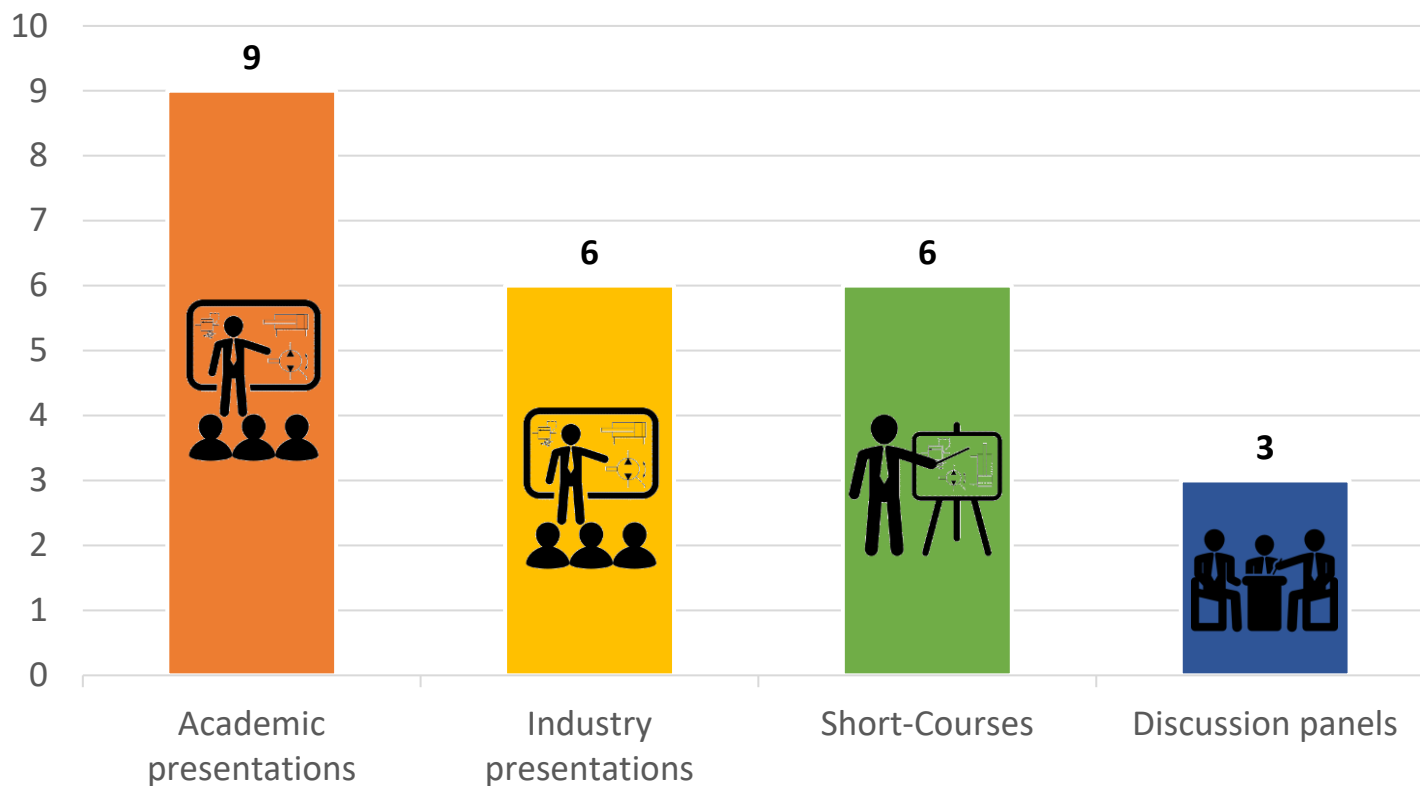
16:30-18:00 Short-Courses C

| | | | | | |
|-------------|---|--|-------------------------------------|--|---|
| 16:30-18:00 | Practical Method for Identification and Compensation of Dead Zone in Directional Spool Valves (In Portuguese) | Antonio C. Valdiero | Professor |  Laboratório de Hardware |  |
| 16:30-18:00 | Sizing and Design of Hydraulic Positioning Systems | Marcos P. Nostrani | Professor |  HIDRÁULICA & PNEUMÁTICA |  |
| 18:00-18:15 | Concluding Remarks | Victor De Negri Petter Krus Luciana Pereira | Professor Professor Professor | UFSC LIU UFABC | |

WIEFP2022 - Presenters and panelists

Number of presenters and panelists: 30

WORKSHOP CONTENTS



WIEFP2022 - Presenters and panelists

Universities/Research groups



Industries



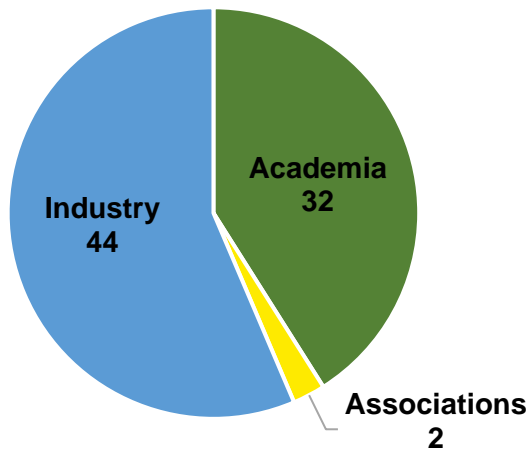
Foundations and Associations



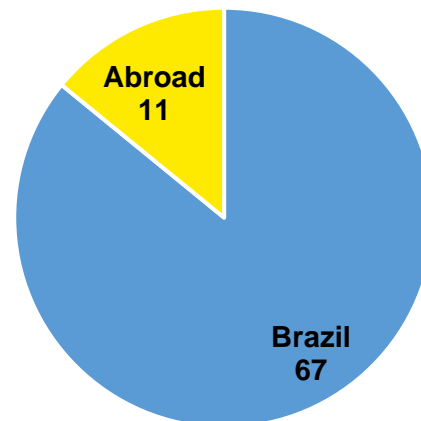
WIEFP2022 - Participants

Total number of participants: 78

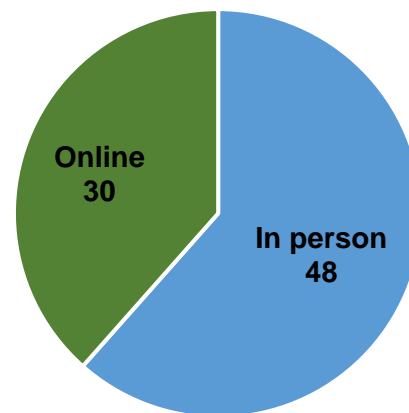
N. PARTICIPANTS/SECTOR



N. PARTICIPANTS/ORIGIN



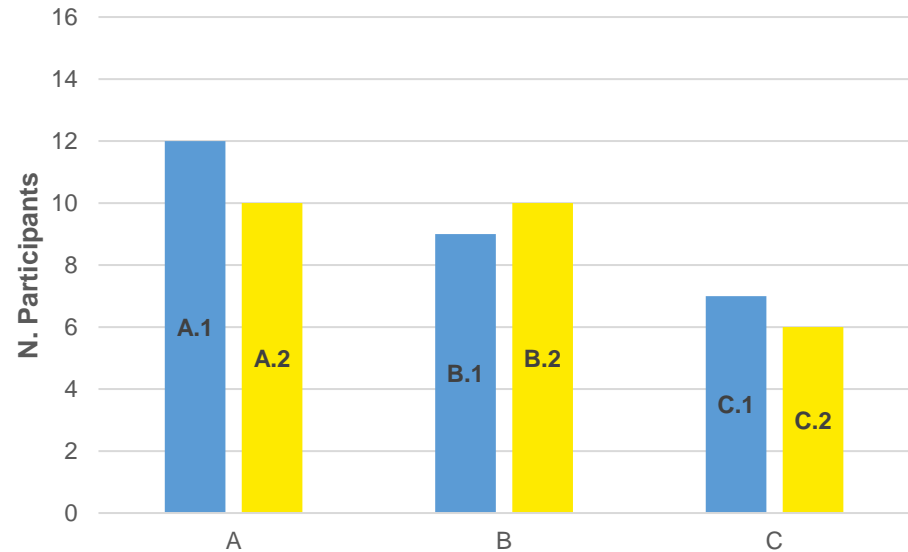
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WIEFP2022 - Short-Courses Participants

Short-Courses participants: 54

N. PARTICIPANTS/SHORT COURSES



| Short-Course | Title |
|--------------|---|
| A.1 | On-Line Monitoring of The Hydraulic System and Its Advantages |
| A.2 | Force and Impedance Control of Hydraulically-Actuated Robots |
| B.1 | Proactive Maintenance Engineering in Hydraulic Systems |
| B.2 | Sizing and Dynamic Properties of Hydro-Mechanical Transmissions for Mobile Machines |
| C.1 | Practical Method for Identification and Compensation of Dead Zone in Directional Spool Valves |
| C.2 | Sizing and Design of Hydraulic Positioning Systems |

WIEFP2022 - Participants affiliation

Representatives from 29 different companies:

- AGCO
- Autoval Válvulas e Equipamentos Industriais Ltda
- Bahri Inteligência Industrial
- Bosch Rexroth
- Camozzi
- Central Brasileira de Automação Ltda
- Connect Gases
- Embraer
- Emerson - Ascoval
- Flowval
- Fluipress Automação
- Gerdau S/A
- GreyLogix Brasil
- Hidrás Automação Ltda
- Hudiksvalls Hydraulikkcluster (HHK)
- HYDAC
- Hydraulic Solutions Ltda
- HYTEC Automação Ltda
- Interbrasil
- Mitsubishi Chemical Group
- Moog do Brasil Controles Ltda
- Primaserra Automação e Inovação
- Robert Bosch
- Saab
- SmartSide Automação e Controle
- TCT Hidráulica
- Techsale
- Volvo C.E. AB
- Zorfatec

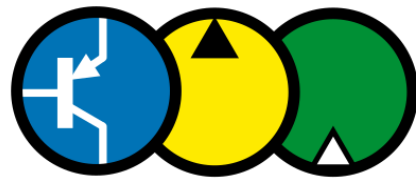
WIEFP2022 - Participants affiliation

Representatives from 12 Universities:

- IFSC
- IFsul
- ITA
- Linköping University
- RWTH Aachen University
- TU Dresden
- UFABC
- UFSC
- UNIFESSPA
- UniSatc
- University of Minnesota
- USP/EESC

And 2 Associations and Foundations:

- Abimaq/CSHPA
- Fundação CERTI



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Organizers:



Support:



Sponsoring Companies:

