

Delft Days on Magnetocalorics

DDMC 2015

Nov. 02-03, 2015

Science Centre Delft
Mijnbouwstraat 120, Delft



November 02 (Monday)

08:30 - 09:15 Registration

09:15 - 09:30 Opening address
Dr F. Doetz BASF New Business

Session Monday-I

Chair: E. Brück - TUDelft

09:30 - 10:00

Fully operational prototype of a 1 kW thermo-magnetic motor for generating electricity from $<80^{\circ}\text{C}$ heat

P. S. Coray - Univ. Applied Sciences Northwestern Switzerland, Switzerland

10:00 - 10:30

Thermodynamics and kinetics-driven dual states in $\text{FeMn}(\text{PSi})$ alloys

L. Vitos - KTH Stockholm, Sweden

10:30 – 10:45 *Coffee Break*

10:45 - 11:00

Ab initio study of the piezomagnetic and mechanocaloric effects in Mn-antiperovskites

J. Zemen - Imperial College, UK

11:00 - 11:30

Multicaloric effects in first-order phase transitions

L. Mañosa - Universitat de Barcelona, Spain

11:30 - 11:45

Thermodynamic models of the magnetocaloric effect at first order phase transitions

V. Basso - INRIM- Torino, Italy

11:45 - 12:00

Rotational magnetocaloric effect

K.P. Skokov - TU Darmstadt, Germany

12:00 - 14:00 *Lunch break + posters*

Session Monday-II

Chair: L. Caron - MPI CPfS

14:00 - 14:30

Recent developments in $(\text{Mn,Fe})_2(\text{P,Si})$ materials

H. Yibole - TU Delft, Netherlands

14:30 - 14:45

^{55}Mn and ^{31}P NMR study of $(\text{Mn,Fe})_2(\text{P,Si})$ compounds

G. Allodi - University of Parma, Italy

14:45 - 15:00

Structural analysis and magnetic anisotropy of MnFe_4Si_3 single crystals

P. Hering - Forschungszentrum Jülich, Germany

15:00 - 15:30

Kinetic-arrest induced phase coexistence and metastability in $(\text{Mn,Fe})_2(\text{P,Si})$

X.F. Miao - TUDelft, Netherlands

15:30 - 15:45

Shedding light on first-order magnetostructural transitions

M. Boeije - TU Delft, Netherlands

15:45 - 16:00

Microstructure and history-dependence of the first magnetoelastic transition in Mn-Fe-P-Si compounds

A. Bartok - CNRS Paris - Saclay France

16:00 – 16:15 *Coffee Break*

Session Monday-III

Chair: M. Acet - Univ.Duisburg-Essen

16:15 - 16:45

From prototype to a commercial product

O. Rogge - BASF, Germany

16:45 - 17:15

Multifunctional ferromagnetic shape memory alloys for solid state refrigeration

F. Albertini - IMEM, Parma, Italy

17:15 - 17:30

Designing cubic Heusler alloys for magnetocaloric-base applications

L. Caron MPI-CPfS, Dresden, Germany

17:30 - 17:45

Field-Temperature phase diagrams of freestanding and substrate-constrained Ni-Mn-Ga-Co films

R. Niemann - IFW Dresden, Germany

17:45 - 18:00

Residual stress induced stabilization of martensite phase and its effect on the magneto-structural transition in Mn rich Ni-Mn-In/Ga magnetic shape memory alloys

S. Singh - MPI CPfS Dresden, Germany

19:00 *Dinner*

November 03 (Tuesday)

Session Tuesday-I

Chair: S. Russek - Astronautics

09:00 - 09:30

Improved efficiency of a rotary active magnetic regenerator

K. Engelbrecht - DTU, Denmark

09:30 - 09:45

Experimental and numerical analysis of a sphere packed-bed AMR

J. Barbosa - UFSC, Brazil

09:45 - 10:00

Practical refrigerated appliance design and the problems posed to magnetocaloric machines

D. Beers - General Electrics

10:00 - 10:15

Performance evaluation of a magnetic refrigerator

J. Lozano - Federal Univ. of Santa Catarina, Brazil

10:15 - 10:30

Current development status of LaFeSi-based magnetocaloric alloys on an industrial scale

A. Barcza - Vacuumschmelze GmbH, Germany

10:30 – 10:45 *Coffee Break*

Session Tuesday-II

Chair: L. Cohen - Imperial College London

10:45 - 11:00

Perovskites RCrO_3 (R = Y, Yb, Er, Sm): a magnetocaloric effect comparability study

G.N.P. Oliveira - Univ. Porto, Portugal

11:00 - 11:30

DRREAM: Drastically Reduced use of Rare Earths in Applications of Magnetocalorics

K. Sandeman - City Univ. of New York, USA

11:30 - 12:00

Hysteresis in magnetocalorics

M. Acet - Univ.Duisburg-Essen, Germany

12:00 - 14:00 *Lunch break + Posters*

Session Tuesday-III

Chair: A. Waske - IFW Dresden

14:00 - 14:30

Synergetic optimization of magnetic refrigerant and cooling system

O. Gutfleisch - TU Darmstadt

14:30 - 14:45

Temperature hysteresis and latent heat avalanches in $\text{LaFe}_x\text{Mn}_y\text{Si}_z\text{-H}_{1.65}$

C. Bennati - INRIM, Torino

14:45 - 15:00

Effect of carbon interstitials on the hydrogen stability in $(\text{La,Ce})(\text{Fe,Mn,Si})_{13}\text{C}_x\text{H}_y$ magnetocaloric materials

X. Hai - Instituut Néel, Grenoble, France

15:00 - 15:15

Exploring La-Fe-Si for balancing magnetic and non-magnetic properties

J. Liu - Chinese Academy of Sciences, Ningbo

15:15 - 15:30

Three-dimensional screen printing of $\text{LaFe}(\text{Co,Mn})\text{Si}$

M. Dressler - Fraunhofer, Dresden

15:30 - 16:00

Windows open for magnetostructural transitions

E. Liu - Chinese Academy of Sciences, Beijing, China

16:00 - 17:00 *farewell drinks*

Posters

- Synthesis of $Gd(Fe_{1-x}Co_x)_2$ compounds for magnetocaloric and magnetostriction studies
V.M. Andrade Olivera - Univ. Porto, Portugal
- Multifunctional $Gd_5(Si,Ge)_4$ thin films characterization and ex situ treatments optimisation
J. H. Belo - Univ. Porto, Portugal
- FEM-based simulations of magnetocaloric heat-exchanger and comparison with real devices
D. Benke - TU Darmstadt, Germany
- Effect of temperature step size on calculating the magnetic entropy change
H. N. Bez - DTU, Denmark
- The total lifetime cost of a magnetic refrigerator
R. Bjørk - DTU, Denmark
- On the operating conditions of solid-state magnetic refrigerators
B. D. Bordalo - Univ. Porto, Portugal
- Demagnetization phenomena in spatial varying packed bed regenerators
T. Christiaanse - Univ. Victoria, Canada
- Numerical simulation of an tapered bed AMR
S. Dall'Olio - DTU, Denmark
- Conversion of waste heat based on the magnetocaloric effect
G. El Achkar - Univ. Lorraine, France
- Magnetocaloric effect in Cu-doped NiMnSn bulk alloys
Esaki Muthu S. - INAC/SPSMS, CEA Grenoble, France
- Influence of the microstructure on the magnetocaloric properties of Mn-Fe-P-Si
M. Fries - TU Darmstadt, Germany
- MnFePSi-based magnetocaloric packed beds: structural details probed by non-destructive X-ray tomography
A. Funk - IFW Dresden, Germany
- Advanced characterization on different time and length scales
T. Gottschall - TU Darmstadt, Germany
- Electronic and magnetic properties of phosphorus in $(Mn,Fe)_2(P,Si,B)$ giant magnetocaloric materials
F. Guillou - ESRF Grenoble, France
- Development of an innovative rotary magnetic refrigerator prototype
B. Huang - TUDelft, Netherlands
- Optimization of permanent magnet assemblies
A. R. Insinga - DTU, Denmark
- Study of multi-layer active magnetic regenerators using magnetocaloric materials with first and second order phase transition
T. Lei - DTU, Denmark
- NiMnIn alloy for magnetobarocaloric heat pump application
D. Lewandowski - Wrocław Univ. of Technology, Poland
- Relaxation dynamics driven by the first-order character of magnetocaloric $La(Fe,Mn,Si)_{13}$
E. Lovell - Imperial College London, UK
- Epitaxial Ni-Mn-Ga-Co thin films on PMN-PT substrates for multicaloric applications
R. Niemann - IFW Dresden, Germany
- Influence of structural disorder on normal and inverse magnetocaloric effect in C15-type Laves phases
N. Pierunek - Institute of Molecular Physics, Poznań, Poland
- Influence of short time milling in $R_5(Si,Ge)_4$, $R = Gd$ and Tb , magnetocaloric materials
A. L. Pires - Univ. Porto, Portugal
- Basic mechanism and mastering of hysteresis at first-order magnetostructural transitions
F. Scheibel - Univ. Duisburg-Essen, Germany
- Enhanced thermal conductivity in Fe-rich La-Fe-Si-based magnetocaloric alloys
Y. Shao - Chinese Academy of Sciences, Ningbo, China
- Non-universal scaling of the magnetocaloric effect as an insight into magnetic phase transitions
A. Smith - DTU, Denmark
- Numerical modeling of a parallel plate magnetocaloric heat pump
J.J. Stoter - Univ. Twente, Netherlands
- The new magnetocaloric phases $R_2T_{3-x}Si_x$ ($R = Ce, Pr, Nd, Gd, Tb, Dy$; $T = Co, Ni$).
S. Tencé - Univ. Bordeaux, France
- Performance assessment of different AMR matrix geometries
P. Trevisoli - Federal Univ. of Santa Catarina, Brazil
- Development of a magnetic refrigerator based on nested Halbach magnets and a multi-layer regenerator
D. Velázquez - Univ. Zaragoza, Spain
- Production of La-Fe-Si spherical granules
H.A. Vieyra - Vacuumschmelze GmbH, Germany
- Electric field control of the magnetocaloric effect
D. H. Wang - Nanjing University, China
- Experimental investigation and FEM simulation of epoxy-bonded magnetocaloric composites
A. Waske - IFW Dresden, Germany