Type: **Poster/Oral presentation**

**Materials with first-order transition and inverse**

**magnetocaloric effect and their peculiarities**

**Maximum 300 words:** NiMn-based Heusler alloys and Fe-Rh compounds have been widely studied due to their large inverse magnetocaloric effect (MCE) [1, 2, 3] and other interesting properties [4, 5] originating from the first-order magnetostructural transition they are exhibiting. In general, the low-temperature phase has a lower magnetic moment and lower volume than the high-temperature one. Therefore, not only the magnetization changes during this transformation, but also the volume of the crystal lattice. Consequently, a magnetic field shifts the transition towards lower temperatures, while applying hydrostatic or uniaxial pressure shifts it toward higher temperatures. The transition can be induced by magnetic-field application resulting in an inverse MCE - the cooling of the material [6]. We have widely studied these alloys in pulsed magnetic fields, specifically, measuring the adiabatic temperature change, Δ*Tad*. In this work, we present an overview of the Δ*Tad* characterization in magnetic fields up to 50 T through different examples of NiMn-based Heusler alloys and Fe-Rh compounds. We show the general characteristics of the MCE of this class of materials and discuss their peculiarities.

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**Primary authors:** SALAZAR MEJIA, Catalina (Helmholtz-Zentrum Dresden-Rossendorf); NIEHOFF, Timo (Helmholtz-Zentrum Dresden-Rossendorf); GOTTSCHALL, Tino (Helmholtz-Zentrum Dresden-Rossendorf)

**Presenter:** SALAZAR MEJIA, Catalina (Helmholtz-Zentrum Dresden-Rossendorf)