



Contribution ID: 373

Type: Poster

## Numerical study of the dimensionally reduced 3D Ising model

*Tuesday, 30 July 2024 18:15 (1 hour)*

We study the 3D Ising model in the infinite volume limit  $N_{x,y,z} \rightarrow \infty$  by means of numerical simulations. We determine  $T_c$  as well as the critical exponents  $\alpha, \beta, \gamma$  and  $\nu$ , based on finite-size scaling and histogram reweighting techniques. In addition, we study a “dimensionally reduced” scenario where  $N_z$  is kept fixed (e.g. at 2, 4, 8), while the limit  $N_{x,y} \rightarrow \infty$  is taken. For each fixed  $N_z$  we determine  $T_c$  as well as  $\alpha, \beta, \gamma, \nu$ . For  $T_c$  we find a smooth transition curve which connects the well known critical temperatures of the 2D and the 3D Ising model. Regarding  $\alpha, \beta, \gamma, \nu$  our data suggest that the “dimensionally reduced” Ising model is in the same universality class as the 2D Ising model, regardless of  $N_z$ .

**Primary author:** KIEL, Tolga (University of Wuppertal)

**Co-author:** DURR, Stephan (University of Wuppertal)

**Presenter:** KIEL, Tolga (University of Wuppertal)

**Session Classification:** Poster session and reception

**Track Classification:** Theoretical Developments