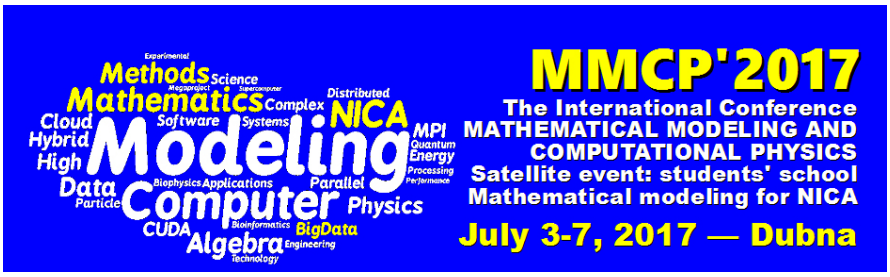

Contribution ID: **153** Type: **not specified**

The Numerical Evaluation of Universal Quantities of Directed Bond Percolation: Three-loop Approximation

Monday, 3 July 2017 16:00 (15 minutes)

Universal quantities (anomalous dimensions and critical exponents) of directed bond percolation are calculated by the renormalization group method in higher order perturbation theory. We put forward a renormalization procedure for a numerical calculation in which the quantities are expressed in terms of irreducible renormalized Feynman diagrams. The procedure is based on the perturbative renormalization scheme in formally small parameter ϵ, where $\epsilon = 4 - d$ denotes a deviation from an upper critical dimension. Numerical calculation of integrals has been performed using Vegas algorithm from CUBA library. Main resulst of our approach is a calculation of the dynamical exponent z and the critical exponent η to the third order in ϵ expansion.

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Session Classification: Mathematical methods for complex systems