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Critical exponents of directed percolation universal class: Three-loop approximation

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Directed bond percolation problem is an important model in statistical physics. It provides a paramount example of non-equilibrium phase transitions. Up to now its universal properties are known only to the second-order of the perturbation theory. Here, our aim is to put forward a numerical technique with critical exponents of directed percolation universality class can be calculated to the higher orders of perturbation theory. It is based on the perturbative renormalization scheme in ε, where $\varepsilon = 4 - d$ is a deviation from the upper critical dimension. Within this procedure anomalous dimensions are evaluated in two different subtraction scheme: Minimal subtraction scheme and null-momentum scheme. Numerical evaluation of integrals has been done using Vegas algorithm from CUBA library. The final results are compared with analytic calculation in two-loop approximation and Monte Carlo simulations.

Primary author: Mr MIZISIN, Lukas (Institute of Experimental Physics, SAS, Kosice, Slovakia)

Co-authors: Prof. MICHAL, Hnatic (Bogoliubov Laboratory of Theoretical Physics, JINR); Prof. ADZHEMYAN, L. Ts. (Department of Theoretical Physics, St. Petersburg University); Dr LUCIVJANSKY, Tomas (Faculty of Science, P. J. Šafarik University)

Presenter: Mr MIZISIN, Lukas (Institute of Experimental Physics, SAS, Kosice, Slovakia)

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