

Hydrodynamic limit for a type of exclusion processes with slow bonds in dimension greater than 2

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Session : Systèmes à une infinité de particules en interaction et applications

Hydrodynamic limit for a type of exclusion processes with slow bonds in dimension greater than 2

par **Tertuliano Franco**

Let Λ be a connected closed region with smooth boundary contained in the d -dimensional continuous torus \mathbf{T}^d . In the discrete torus $N^{-1}\mathbf{T}_N^d$, we consider a nearest neighbor symmetric exclusion process where occupancies of neighboring sites are exchanged at rates depending on Λ in the following way : if both sites are in Λ or in its complement Λ^C , the exchange rate is one ; If one site is in Λ and the other one is in Λ^C and the direction of the bond connecting the sites is e_j , then the exchange rate is defined as N^{-1} times the absolute value of the inner product between e_j and the normal exterior vector to $\partial\Lambda$. We show that this exclusion type process has a non-trivial hydrodynamical behavior under diffusive scaling and, in the continuum limit, particles are not blocked or reflected by $\partial\Lambda$. Thus the model represents a system of particles under hard core interaction in the presence of a permeable membrane which slows down the passage of particles between two complementar regions.

Joint work with Adriana Neumann and Glauco Valle.

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