

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

Tertuliano Franco

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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  $\Lambda$  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  $\Lambda$  in the following way : if both sites are in  $\Lambda$  or in its complement  $\Lambda^C$ , the exchange rate is one ; If one site is in  $\Lambda$  and the other one is in  $\Lambda^C$  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.

*Adresse :*

Tertuliano FRANCO

IMPA

Estrada Dona Castorina 110, Jardim Botânico.

Rio de Janeiro, 22460-320, Brazil

E-mail : [tertu@impa.br](mailto:tertu@impa.br)