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On the motion of substance in a channel of a network and human migration

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*Highlights (for review)

Highlights

1. A model is discussed for motion of substance in a channel consisting of nodes of a network.

2. Heavy tailed distributions are obtained for the amount of substance in the nodes of the channel.

3. The model is applied to human migration in a chain of countries.

4. Conditions for concentration of migrants in a country of the channel are obtained.

5. Zipf distribution for number of migrants is obtained for country borders with limited permeability and large attractiveness of the final destination country.

6. The decrease of number of migrants in the channel by limiting the number of migrants arriving in the incoming country is more effective than a decrease by reducing permeability of the borders between countries of the channel.